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CENTS
MOTOR
BOATING

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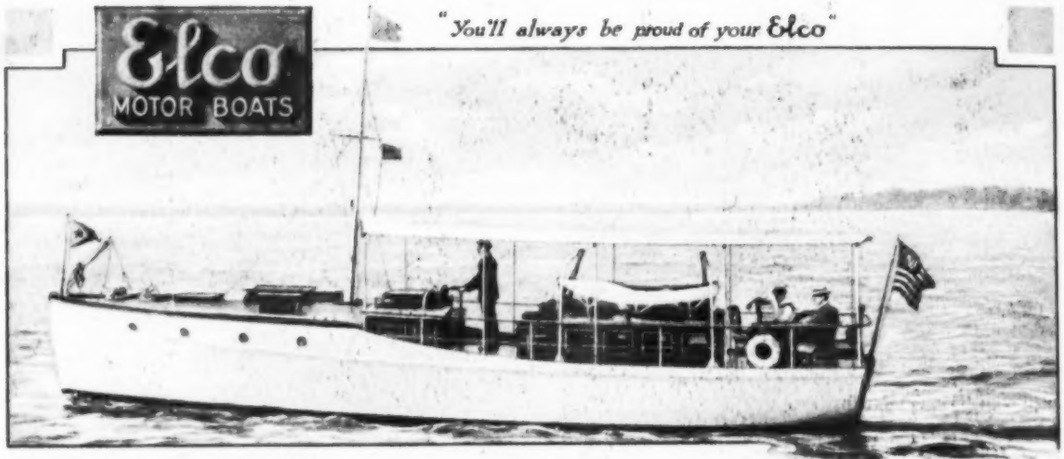

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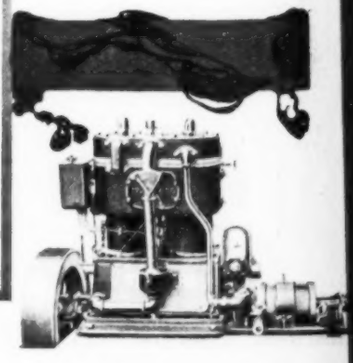

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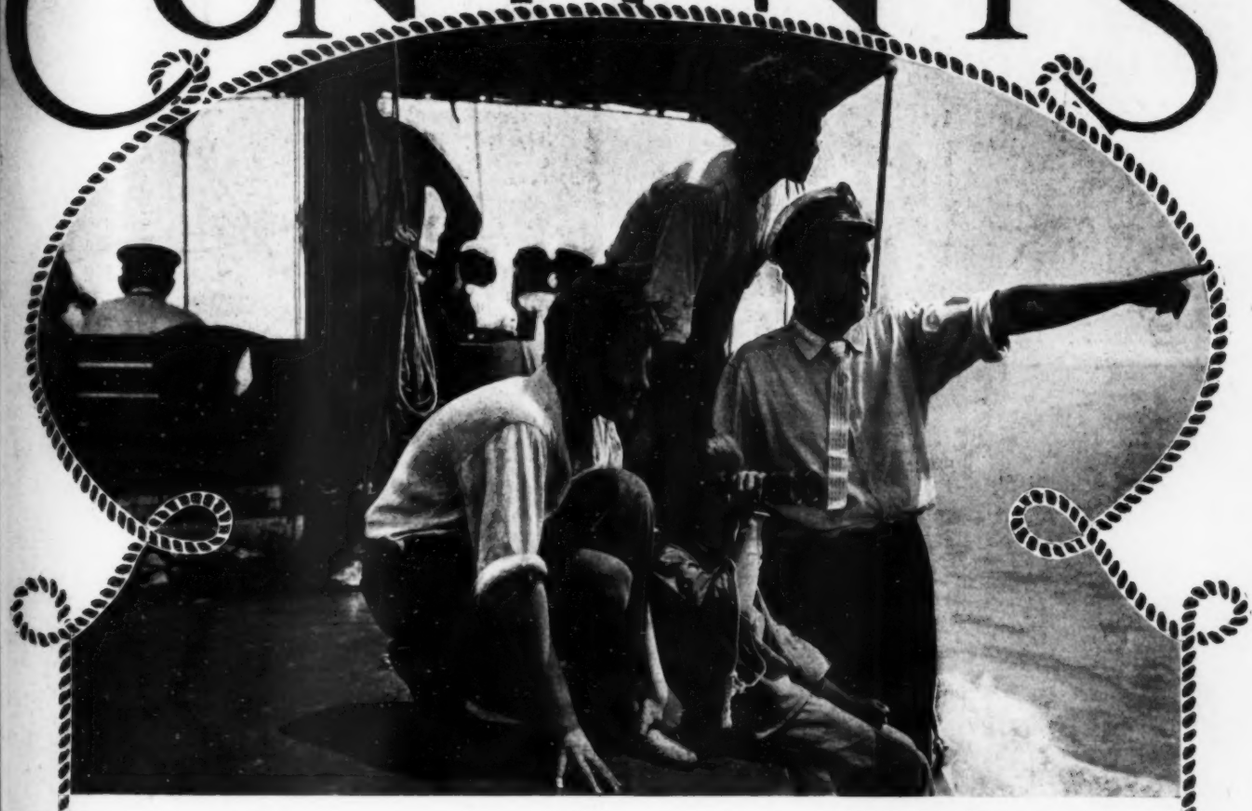
CONTENTS



September, 1913.

Racing at Put-in-Bay.....Frontispiece
Perry Centennial Races..... 3
Halcyon, a Distinctive Cruiser..... 6
Races at the Thousand Islands..... 8
Uncle Sam's Inspection Boat..... 10
Using the Lead..... 11
Self-Starters..... 12
Challenging Team for the B. I. Trophy..... 14
Single-, Twin- and Triple-Screw Propulsion..... 15

New Motor Boats—

A 1914 Sixty-five-Foot Cruiser..... 16
A Speedy Day Cruiser..... 17
A Fast V-Bottom for Open Water..... 18
An Able Coastwise Cruiser..... 18
Ponce—A Boat for Gunning..... 19
Sispud II..... 20
A Topsail Auxiliary Schooner..... 21
Natoma..... 22
A Work Boat for the Gulf..... 24
A Fifty-five-Foot Southern Cruiser..... 25
A Buoyant Fresh-Water Cruiser..... 26
A Speedy Herreshoff Model..... 27
Nymph, a Real Cruiser..... 27

The Prize Contest in Questions and Answers—

Constructing a Water-Tight Cockpit..... 28
Power Output per Cylinder..... 30
Why Do Boats Squat?..... 31

The Care of the Vibrator..... 33
A Mooring Raising Device..... 33
Among the Clubs..... 34
Table of Results of Toledo and Put-in-Bay Races. 36
From Motor Boating Readers..... 37
Boats of Stock Design..... 39

Marine Motors—

Twentieth Century, Automatic, Toledo and Anderson..... 40

New Things for the Motor Boatman..... 42
Yard and Shop..... 44

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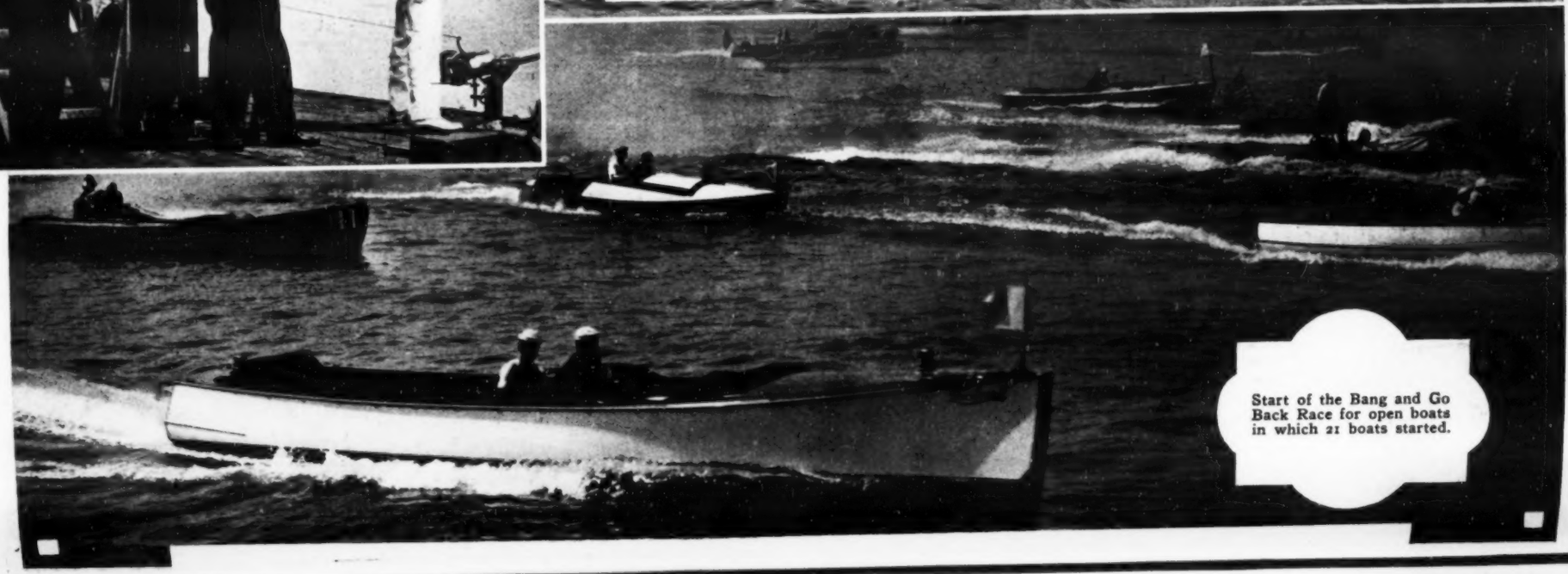
Start of the Bang and Go Back Cruiser Race at Put in Bay.



Start of the Bang and Go Back Race for open boats in which 21 boats started.

The Perry Centennial Races.

An Analytical Story of the Great Series of Racing Events at Toledo and Put In Bay With Some of the Lessons Taught.

By Charles F. Chapman.

ONE hundred years ago,—in 1813, Commodore Perry made history on Lake Erie with his fleet of wind-driven warships; one hundred years later—in 1913, mainly through the efforts of Commodore Jones, history has been made by a fleet of motor boats. In each case, one boat went to the bottom—in the former instance it was Commodore Perry's flagship Lawrence, but in the latter, the unfortunate victim was the hydroplane Bull Moose II. In other respects similies would be far stretched, for our forefathers were striving for victory over a hostile foe and to gain supremacy of the seas, while to-day we were making strenuous efforts to establish new speed records and demonstrate the endurance qualities of the modern motor boat. In both instances victory was the reward.

In some respects the Perry Centennial Motor Boat Races which we have all been talking about for months in the past were the greatest that have ever been held anywhere in the country; in other respects they were sadly lacking. Of the first two days' racing there can be no doubt, and if the remainder of the week's programme had been scheduled for the Maumee River or on Lake Erie with Toledo as a starting point, there would have been no reason to qualify the above statement.

Kitty Hawk, winner of the Free-for-All, She is powered with a 300 H.P. Van Blerck motor.

Chinook, winner of the National Championship. She is driven by a Scripps motor.

At Toledo, Ohio, the Maumee River permitted a course the like of which we have never seen. True in length to a fraction of a foot, laid out from the Toledo Yacht Club, five miles up the river to a turning mark, directly alongside a city boulevard and all the principal streets of the city. For the entire length an unobstructed view of the races could be had without requiring the services of excursion steamers and privately controlled grandstands. And the people of Toledo were not slow to take advantage of their opportunities either, for they came by the thousands with their camp chairs and lunches, prepared to see the whole performance, from the initial class at ten in the morning until the great Perry Centennial Free-for-All at 5:30 in the afternoon. Those whose business positions would not permit their presence at the earlier events made it a point to witness the free-for-all, and while that was going on the banks of the Maumee River on both sides resembled a street in a country town on the day when the circus makes its annual visit.

The course had other points of merit as well—its surface was not unlike that

Red Devil, owned by O. P. Demars, of Cleveland, Ohio, and powered with a 40-H.P. Loew-Victor motor, winner of the Interstate Trophy.

Kitty Hawk Jr., a Hacker design powered with a 125-H.P. Van Blerck and using a Harthorn propeller. This boat won 2 firsts, 4 seconds, and one third prize in one day at Toledo.

Baby Reliance II, a new hull with the same 180-H.P. Sterling motor drove her to victory in two events. To this boat goes the credit of the best speed for an entire race.

Peter Pan V, which started in more races than any other high-powered hydroplane. Her 180 H.P. Van Blerck stood up like a soldier throughout the week and won many prizes for her owner.

on a polished piano, and no condition is as much appreciated by a high-powered hydroplane as having the right kind of water to race on. One doesn't play billiards on the front lawn, neither should we expect the best results from hydroplane racing in broken water. There are two kinds of broken water, one being due to natural causes, such as the wind, tide, shallow water and the like, and the other is caused by artificial means—one is as bad as the other—a 30-foot cruiser going at a nine-mile rate causes as much discomfort to a fast racer as the chop from a windstorm, and the wash thrown out by a twenty-mile runabout is much worse.

The Maumee River course was absolutely free from any trace of natural roughness, and except on the first day, the other condition was also absent. On the first day, however, due largely to over-enthusiasm more than anything else, some fifty cruisers and runabouts were pressed into patrol service, sent over to the revenue cutter Morrill, where a seaman was put aboard and a revenue flag obtained. From then on these boats became official patrol boats and proceeded to make life miserable for everyone except the real offenders. Up and down

Finish of the Bang and Go Back Race for Cruisers, with Barbara II in the lead. Over 20 boats were entered in this race and the finish was the most exciting of the week. Bar-

the course they went, at full speed all the time, and at the approach of a bunch of racing boats, they were sure to dart across the course directly in front of the racers, throwing rollers which greatly retarded the speed of those trying for records.

As to driftwood on the course, there wasn't any—that is, on the second day when the big events were pulled off. On Monday, the first day, an unusual condition prevailed. While there are no tides on the Great Lakes, as everyone knows, yet one should not believe for a minute that the level of the water does not change. This may change two, four or six feet or even greater amounts in a very short time, depending entirely upon the wind. About noon on Monday there occurred a series of thunder squalls

Scat—a Mullins stock hydroplane, powered with a three-cylinder Pierce-Budd motor, giving her a speed of 27 miles an hour. Scat was game to the core, sailing in seven races in two days.

Hazel II, an Elco-plane which showed over 43 miles per hour, won two first prizes, but ran aground in the big Free-for-All.

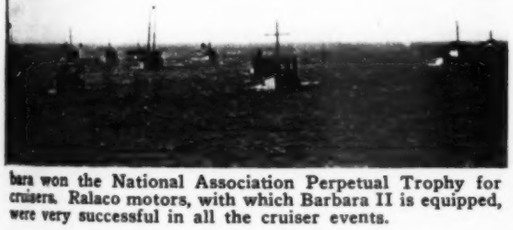
accompanied by much high wind. In almost less time than it takes to tell of it, the level of the Maumee River rose at least two feet. The result was disastrous, as it floated off from the bank of the river all the drift which had been collecting there for ages past. The direction of the wind, constantly shifting throughout a succession of thunder squalls, blew this floating debris back and forth across the course, which was a serious and dangerous menace to the speed boats on Monday.

A similar condition might not occur again for six months; in fact, Commodore Jones was equal to the occasion, for he issued a call to the people of Toledo to clear the river. This was printed broadcast in the daily papers, and resulted next morning in a small army of people putting out in rowboats and other small craft, so that before the first race was started on Tuesday, nothing as large as a floating match obstructed the course.

Monday's races were a disappointment from one point of view. The races scheduled for this day were for the National Association of Engine and Boat Manufacturers' trophies, each very valuable in itself, as a perpetual prize, and going with each was another prize which became the permanent property of the winners. There were boats galore eligible for these races, which, as in the past, were in three heats for each class, but the greater majority of boats absolutely refused to enter the events, evidently desiring to race for the next day's events when cash prizes were offered. Just here the sportsmanship of the Eastern owners showed itself. The only two speed boats to race for the International Championship Trophy were Peter Pan V and Hazel II, owned by James Simpson and A. E. Smith. Both were Eastern boats which had to be shipped a thousand miles for this race, and when they reached their

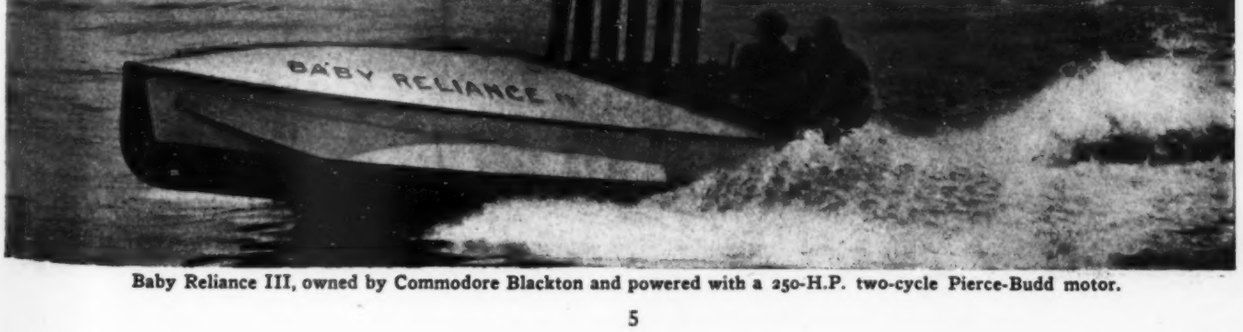
(*Continued on page 60.*)

The two 106-H.P. Curtis aeroplane motors connected in tandem in Hazel II, and the reversing device at the stern used in place of a gear. This boat was built by Elco-Bayonne and is owned by A. E. Smith.



bara won the National Association Perpetual Trophy for cruisers. Ralaco motors, with which Barbara II is equipped, were very successful in all the cruiser events.

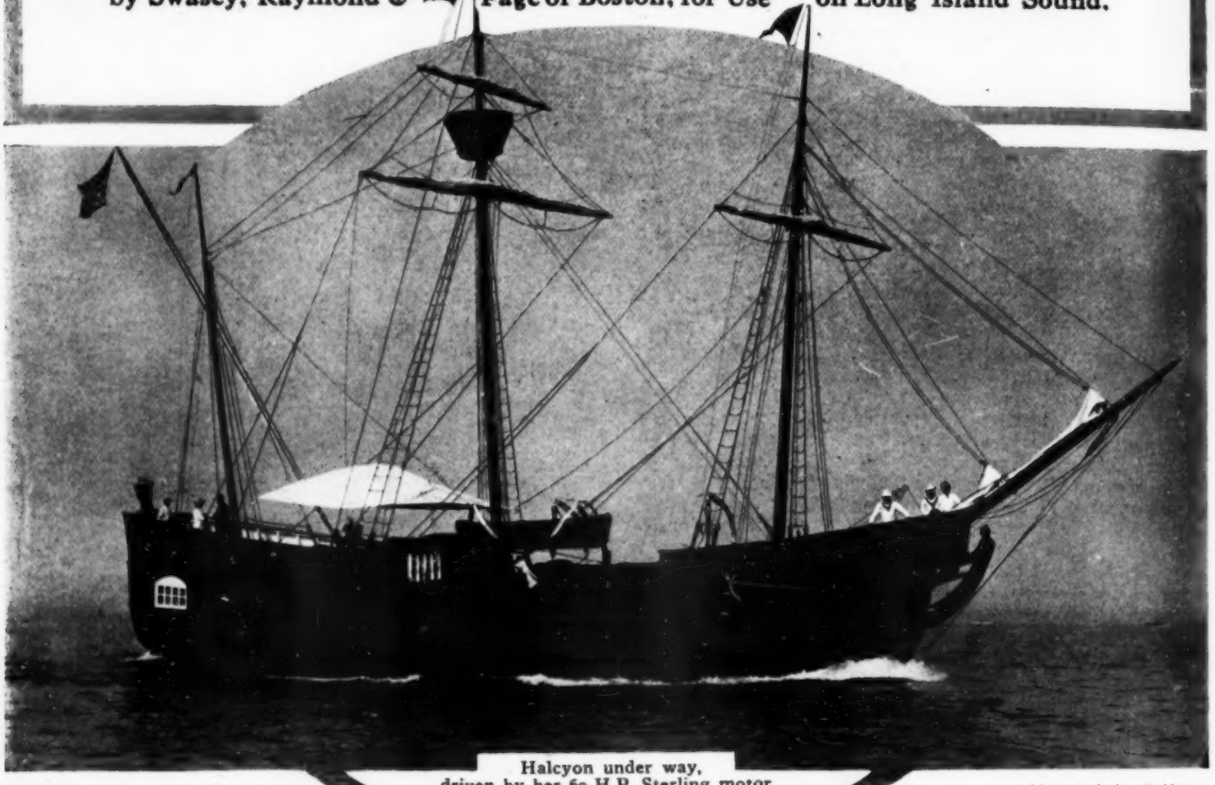
Thelma IV, winner of second prize at the Put-in-Bay Free-for-All. She is powered with a Thelma motor. This is the same boat which made such a good showing last year.



Baby Reliance III, owned by Commodore Blackton and powered with a 250-H.P. two-cycle Pierce-Budd motor.

Halcyon, a Distinctive Cruiser.

An Auxiliary Type, Offering a Maximum of Comfort and Convenience, Designed by Swasey, Raymond & Page of Boston, for Use on Long Island Sound.



Halcyon under way, driven by her 60-H.P. Sterling motor.

Photograph by Stebbins.

TO Mr. Henry A. Moss, of Boston, belongs the distinction of owning what may be termed the most unique motor boat in the world. Although, from outward appearance, a casual observer would be led to suppose that the Halcyon is an auxiliary sail boat, but this is a fallacy in many respects, for the reason that her propulsion is dependent upon a 6-cylinder Sterling motor, under ordinary conditions.

The boat was designed by Messrs. Swasey, Raymond & Page, of Boston, and was built by Messrs. Sterns & McKay, of Marblehead, Mass. This craft, in many respects, is very similar to the vessels built four centuries ago. Compared with modern motor boats this type present a marked contrast, but notwithstanding the high free board, the boat is not top heavy. In fact, the under portion of the hull is well worked out, with full bilges allowing good stability, yet the lines have an easy run, and, consequently, the 60-h.p.motor is sufficient to maintain a speed of seven miles an hour. The spars and rigging are unusually strong and provision is made to carry sufficient sail area to enable the boat to be handled easily

Forward deck, way up in the "eyes" of the ship.

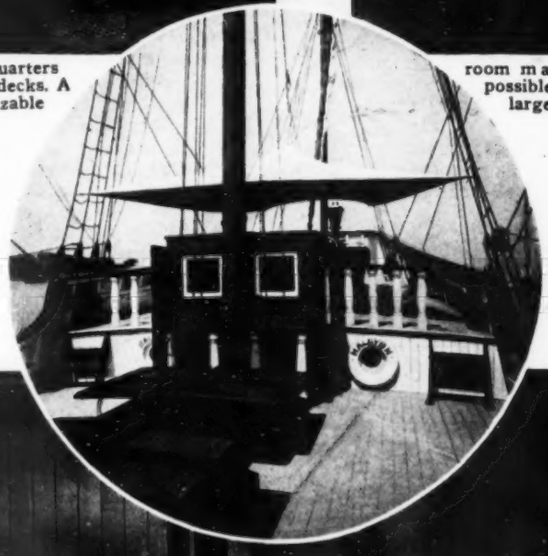
Photograph by Stebbins.

Engine room, showing steel bulkhead and 6-cylinder, 60-H.P. Sterling motor.

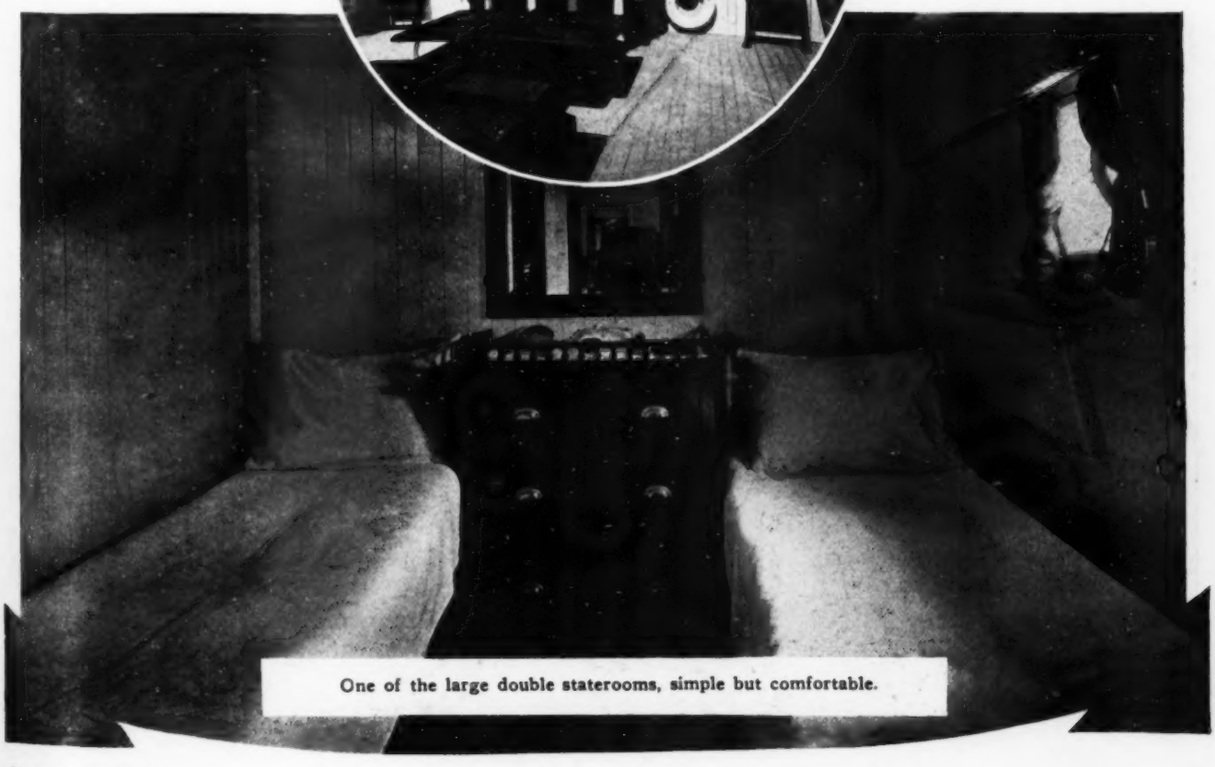
The quarters below decks. A real sizable room made possible by the large beam.

Photograph by Stebbins.

should anything go wrong with the motive power. The sails also serve to steady the boat in a heavy, rolling sea. The steering gear is placed well aft, following the custom of olden times; but the helmsman's position is so high that he is afforded an unobstructed view. The deck space is quite large and well arranged; with easy chairs and seats it proves unusually comfortable. The living compartments below combine comfort with economy of space, and each detail has been worked out to serve some special purpose. The cabins are finished in white enamel and trimmed with mahogany, which forms a very pleasing effect.



The after deck.



One of the large double staterooms, simple but comfortable.

Photograph by Stebbins.

The A. P. B. A. Gold C

A Series of Three Days Races At Alexandria Bay Won by Ankle Deep sand Islands' Yacht Club is

By C. L.

Mutt Jr., which finished fourth. This boat is owned by Dr. J. J. Harty, of Kingston, Ontario, and is powered with a 6 cylinder, 75 H. P. Sterling Motor.

AFTER nine consecutive years at the Thousand Islands, the Gold Challenge Cup of the American Power Boat Association will repose for at least the next twelve months to come on the mantel of the Lake George Racing Association as the result of the races over the Alexandria Bay course on July 31st, August 1st and 2d. Ankle Deep, with its owner, Count Mankowski, at the wheel, turned the trick. It was the story of throbbing engines of three hundred horsepower competing with others of but half the magnitude, with Dame Fortune smiling for the once upon the stronger. For three days the Ankle Deep tore her way over the twenty-nine statute mile course without a skip of its powerful engines. On more than one occasion in years past the consistent work of the lesser boat has served to retain the cup at the Thousand Islands when more powerful rivals rolled helplessly in the seas when some part snapped under the terrific strain.

Never was the Ankle Deep pushed to its limit. With its screws capable of turning up a matter of more than 1,300 revolutions a minute, there were times when less than a thousand were needed to keep the boat to the front. Count Mankowski took no chances, in view of the coming International races, in which the Ankle Deep will compete. It was enough to secure the coveted Gold Challenge Cup.

Weather conditions remained ideal for all three days. A light breeze rippled the water the first day, tempering the excessive heat of the afternoon. On the second day the wind stiffened somewhat, resulting in a choppy sea along the course, and a half hour's delay was necessary.

Several thousand persons witnessed the first day's race from along shores or aboard every conceivable sort of a water craft. There were the gayly decorated yachts of the millionaire and the canoe of the college boy camping on some island perhaps twenty miles away. It was the largest crowd that ever witnessed a race for the Gold Challenge Cup at the Thousand Islands.

For days Ankle Deep had been touted as a winner. As the preliminary gun boomed across the waters, six racers panted as they jockeyed for the start. Live Wire, of the Oak Island Yacht Club, was the only one entered that failed to make an appearance. As the boat had never been regarded as a serious rival, little disappointment was felt by the spectators.

All eyes centered on Ankle Deep, of the Lake George Racing Association, and the Sand Burr III, of the Atlantic City Yacht Club. The latter proved the bitterest sort of a disappointment. Carrying the figures "13," the little red racer came scooting out from a nearby boathouse before the race, But the "13" proved a veritable hoodoo. Never for a moment was the boat a foe worthy of consideration. A crest of water from her

Count Mankowski, owner of Ankle Deep.

Ankle Deep, the most consistent American hydroplane of today, easily took first place on each of the three days racing. She is a Tams, Lemoine & Crane design and powered with two 150 H. P. Sterling racing engines.

Cup Goes to Lake George.

Deep. The Famous Cup Which Has Long Been Held by the Thou- Won by the Challenger.

Grant.

rear seemed to retard rather than assist her speed. On the last stretch the boat lost one of her surface propellers and was trailed home hours later.

The gun boomed again, and the racers were off. A wave of apprehension swept through the crowd as Ankle Deep hung back, seemingly something the matter. Five other racers shot away like arrows. Mitt III, of the Thousand Island Yacht Club, and defender of the cup, winged her way over the water like a swallow.

A roar and Ankle Deep was off. With his face covered by a mask to protect it from the lash of the waters, Count Mankowski stood at the wheel. Life preservers were belted to both the Count and his engineer.

Far down the river the rays of the sun caught the spray of the racers. It was a stern chase that confronted Ankle Deep. A pressure and the racer increased its speed. Never swerving an inch, the glistening sides of the brown Ankle Deep gained foot by foot. Rivals were passed, and as Ankle Deep swung close to the yachts at the end of the first round, she was in the lead. The ten miles had been covered in fourteen minutes and seventeen seconds, and a record was made for the course.

From the moment that she had established a lead, Ankle Deep was never headed. With the spray flying from her sides, the craft tore through the water without a skip or a hitch, winning in 44 minutes and 59 seconds.

P. D. Q. III, of the Chippewa Bay Yacht Club, which was originally designed for Graham Miles, of New York, as the defender of the cup, finished in second place; Mitt III in third place; Little Joker, from down on the Hudson, fourth, and Mutt Jr., from Kingston, Ont., fifth.

The racers were all of the hydroplane type, Little Joker being the smallest of the lot. Painted a dead black, Little Joker elicited plenty of admiration as she danced over the waves, two men clinging like ants to her rear. From the side of Mitt III fin-like affairs spread out and served to prevent an overturning. Jack Vilas, of Chicago, better known as an airman, served as mechanician on Mitt.

The second day's races differed but little from the first, so far as general results were concerned. During the night the gears on Little Joker had been changed, and as a result the racer made a better showing than on the day previous. But it was all to Ankle Deep's liking. Taking heed of the predicament of the day before, Count Mankowski hung back at the start, and instead of again getting in the wake of the others, he kept to the left and encountered free water.

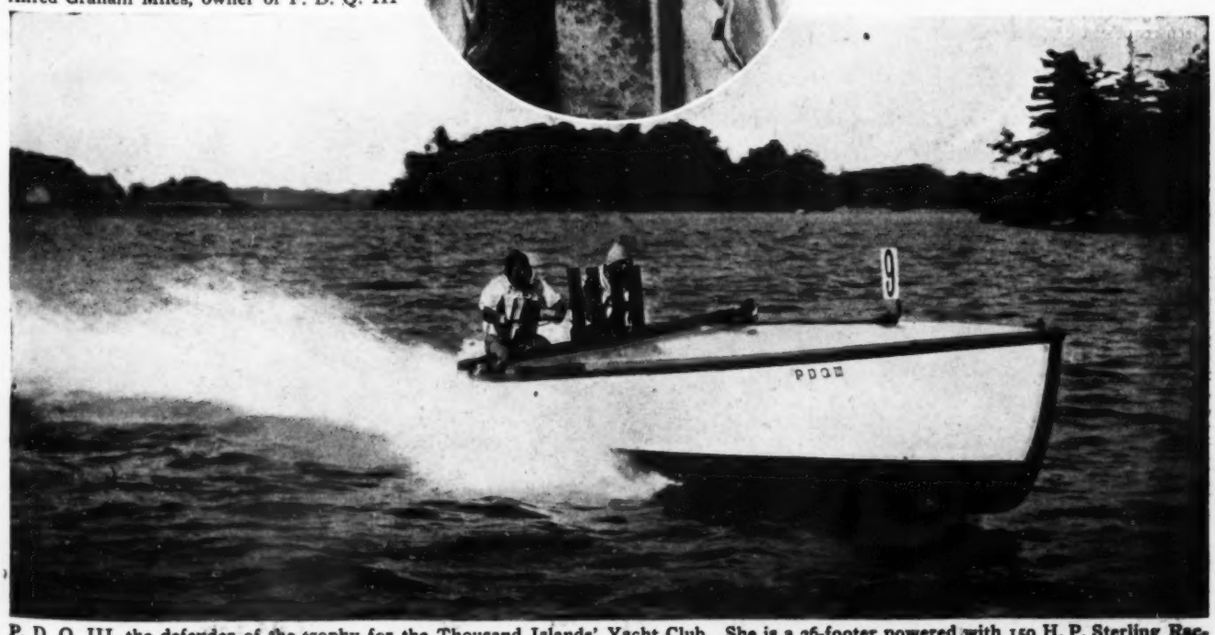
The wisdom of the move was apparent at once. Ankle Deep shot through the water with the speed of an express train. The loss of the Gold Cup to the Thousand Islands became a foregone conclusion. Barring accidents, Ankle Deep was a winner. And the accidents never happened. Over the course the boat sped with engines like clockwork.

The rough water had caused a post-

(*Continued on page* 58.)

Little Joker, owned by H. S. Ford, of Nyack, N. Y., a challenger from the Hudson River. This hydroplane is also powered with 150 H. P. Sterling engine.

Alfred Graham Miles, owner of P. D. Q. III



P. D. Q. III, the defender of the trophy for the Thousand Islands' Yacht Club. She is a 26-footer powered with 150 H. P. Sterling Racing engine and performed most creditably.

Uncle Sam's Inspection Motor Boat.

A Description of the Boat and an Account of the Campaign Which the Government is Carrying on to Educate Owners in Regard to Their Safety.

By Waldon Fawcett.

THE Secretary of Commerce has recently presented to the Congress of the United States a request for an appropriation of the sum of $18,000 for the purchase and maintenance of another motor boat to be used by his branch of the government for the enforcement of the navigation laws applicable to motor boats. This recommendation by the head of the Commerce Department is the sequel of the very creditable record made during the first year of her service by Uncle Sam's initial motor boat inspection launch, the Tarragon.

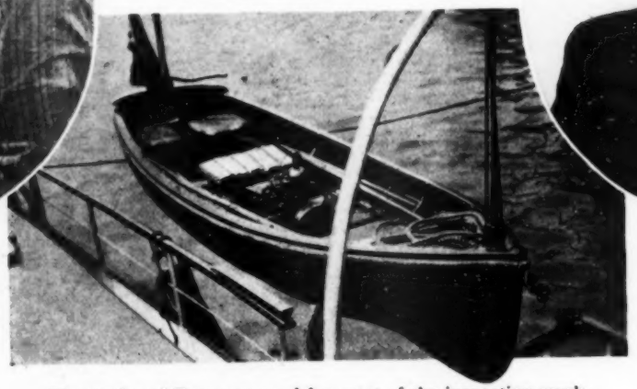
Incidentally, it may be mentioned that Mr. William C. Redfield, the new Secretary of Commerce, took it upon himself a few weeks ago to make a trip on the Tarragon on the occasion of one of her regular patrol expeditions in Chesapeake Bay, and he returned to Washington more than enthusiastic over this new federal activity and anxious for the extension of its scope. The second inspection craft, which has now been requested of Congress, will divide with the Tarragon the responsibilities of a supervision of the motor boats on the Atlantic and Gulf coasts, and it is the plan to, as time goes on, add to this little fleet yet other special motor boats for work on the Great Lakes, on the Pacific Coast and even in Alaskan waters.

Governmental officials are all quick to give much of the credit for the success of federal motor boat inspection to the motor boatmen of the country. It is conceded that without the cooperation of the owners of motor boats much less could have been accomplished. In particular, have the motor boat clubs and similar organizations shown a desire to facilitate Uncle Sam's supervision of this important navigation field.

On the other hand, Uncle Sam is endeavoring to take the role of a counselor and beneficent policeman in the national motor boat fleet. The best evidence of this is afforded by the fact that the Tarragon, which so far bears practically the whole responsibility for motor boat inspection, reported, during her first year which has lately been concluded, a total of more than 900 violations of the law. The penalties imposed in these cases—as prescribed by the statutes—amounted to upward of $300,000, but they were remitted to about $5,000.

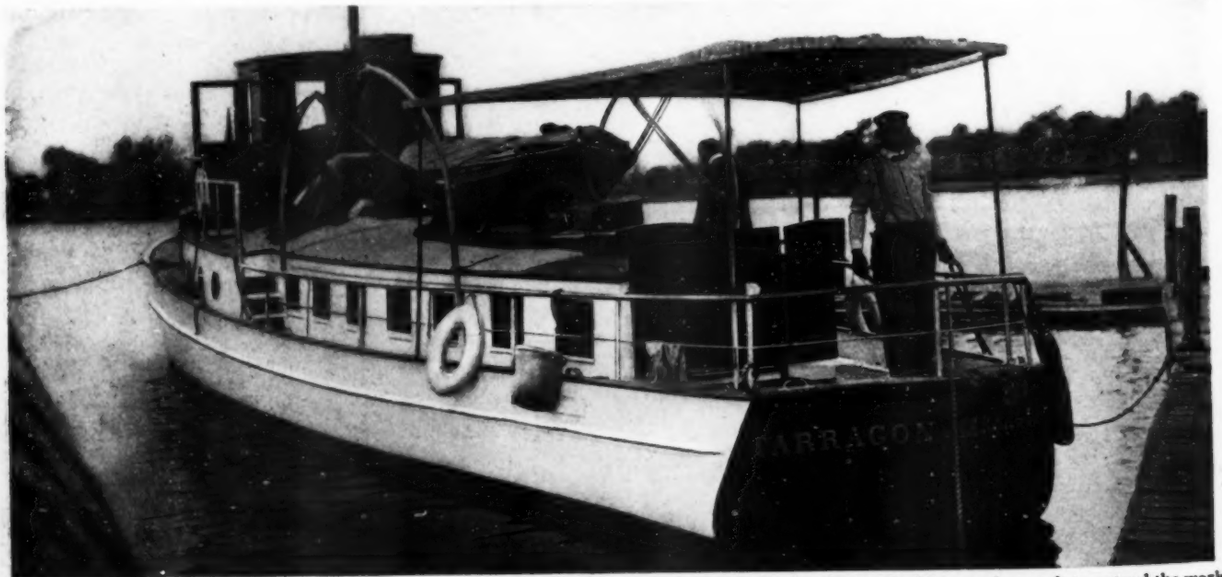
Illustrating the use of a life preserver.

Demonstrating a standard lamp.



The tender of Tarragon used for most of the inspection work.

Capt. Dryden of the Tarragon.

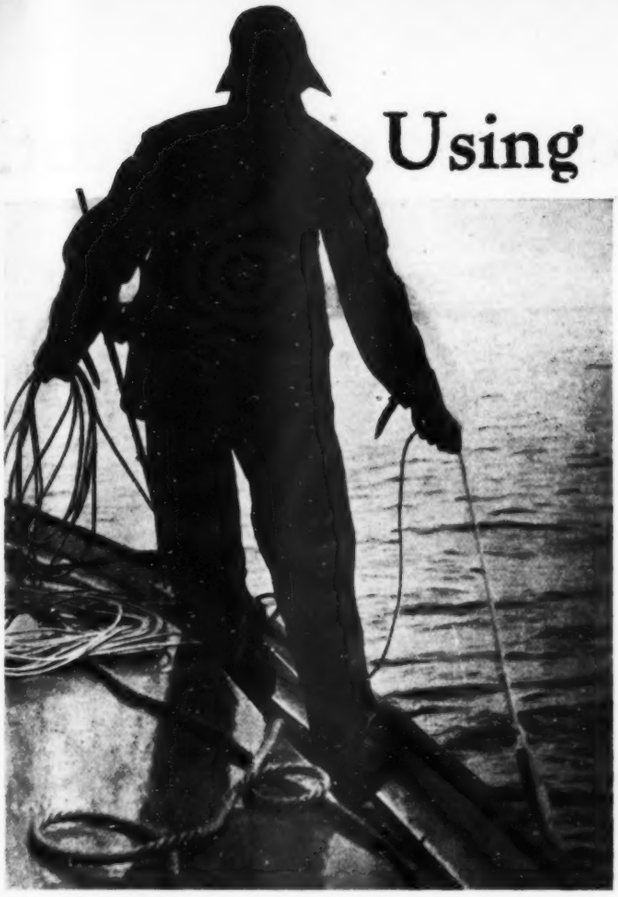


Tarragon, the first boat of its kind, whose record has proven so high that an appropriation has been asked for another craft to extend the work.

Using the Lead.

How the Practical Navigator Is Able to Determine His Exact Location When the Usual Methods Are of No Avail.

By William Washburn Nutting.

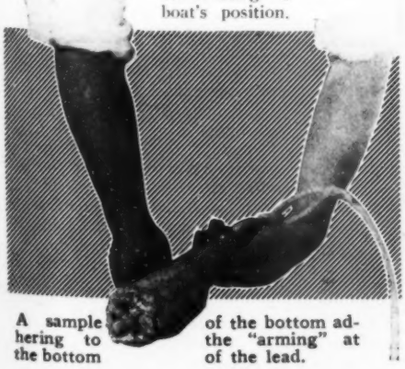


The lead should be cast well ahead of the boat from a position near the bow to get an accurate sounding.

IF you were to ask any one of the skippers of the trim fishing schooners sailing out of Gloucester or T. Wharf, Boston, what his most valuable aid to navigation is, second to the compass, he'd tell you the lead. This humble device, so frequently ignored entirely by the motor boatman is, in the hands of these fishermen, as accurate a means of telling them their position as the sextant is to the skippers of more pretentious craft. And the lead is of much broader use for it is called upon most frequently during fog when the sextant would be worthless.

I have heard of a number of successful masters of fishing craft, Portuguese mostly, who can neither read nor write and who carry their dead reckoning in their heads. If these men were deprived of their leads, they would, in all probability, have to go out of business.

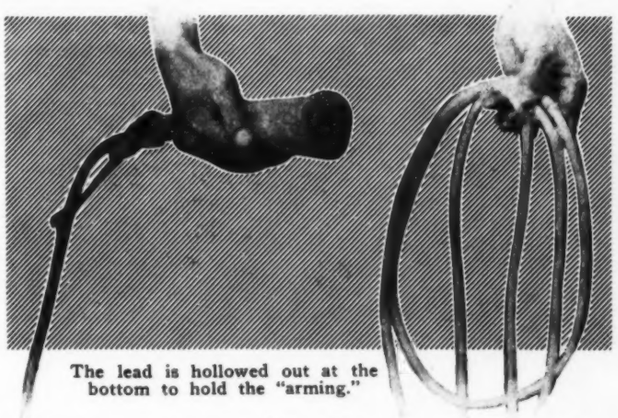
The lead is not merely an instrument for determining the depth of the water, as is generally supposed. With it the character and color of the bottom may be ascertained as well, and this, with the depth, furnishes a wonderfully accurate means of determining a boat's position.



A sample of the bottom adhering to the "arming" at the bottom of the lead.

On its lower end the lead is hollowed out to hold the arming (as the substance is called which is placed there for the purpose of bringing up a sample of the bottom). This is usually tallow or soap to which the sand or gravel readily adheres.

On every Coast Survey chart will be found scattered at frequent intervals among the fathom marks, abbreviations telling the character and color of the bottom. S. sml. bk. St. for instance, denote sand and small black stones, and gy. S. bk. Sp. means gray sand with black specks. The following table, which will be found in the corner of these charts, will enable the reader to decipher the numerous other strange combinations.



The lead is hollowed out at the bottom to hold the "arming."

Materials in Capitals		Colors or Shades two small letters		Other qualities three small letters	
M.	*for Mud*	*bk.*	*for black*	*hrd.*	*for hard*
S.	" *Sand*	*wh.*	" *white*	*sft.*	" *soft*
G.	" *Gravel*	*rd.*	" *red*	*fne*	" *fine*
Sh.	" *Shells*	*gy.*	" *grey*	*crs.*	" *coarse*
P.	" *Pebbles*	*bu.*	" *blue*	*brk.*	" *broken*
Sp.	" *Specks*	*dk.*	" *dark*	*sml.*	" *small*
C.	" *Clay*	*gn.*	" *green*	*rky.*	" *rocky*
St.	" *Stones*	*br.*	" *brown*		
R	" *Rock*				

Note—*The principal materials and their qualities are represented by larger letters than the subsidiary.*

The figures on the chart indicate the depth in fathoms at mean low water except where the water is shaded with fine dots, and here the figures indicate the depth in feet. The shaded portion, marked in feet, includes the shoals along the coast line, together with outlying bars, etc., which are less than three fathoms or eighteen feet in depth; and there are usually a couple of irregular lines roughly paralleling the shore line, which are known as five and ten-fathom curves. These curves and the shaded portion give an excellent idea of the topography of the bottom.

As to size, while this will vary in different cases, get a lead that is heavy enough to reach bottom before it is overrun by the boat. The one shown in the photograph weighs twelve pounds and seems rather a husky instrument upon first acquaintance, but I have found it just right for my own case. If cast well ahead of the boat it will reach the bottom, even in 25 fathoms, before it begins to trail astern, which, of course, is necessary for accurate results. They had one about twice that size on a schooner I met up with once. She was all shot to pieces as a result of the well-remembered gale of July 28, 1911. We were sailing a dory from New York to Boston and boarded her off Cape Cod thinking her a derelict, and as we all curled up on the roof of the wrecked cabin house that night I remember being startled by a loud splash at regular intervals and of dreaming that the crew were falling overboard, one by one. In the morning I realized that it was merely the splash of the lead as the mate tried to determine his position in the fog by sounding.

The line I use is a heavy-beaded cotton one similar to the kind employed to swing the weights of windows. It doesn't kink much and has very little shrinkage when wet. It is marked in the good old salty method and, while there are simpler ways of determining the fathom marks, I rather like to preserve the old traditions aboard my boat. It's half the fun.

The following table shows the method of marking the line:

1 fathom from the lead—1 strip of leather.

2 fathoms from the lead—2 strips of leather.

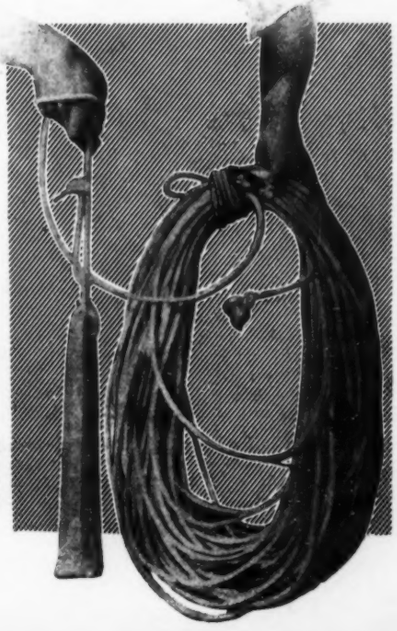
3 fathoms from the lead—3 strips of leather.

5 fathoms from the lead—a white flannel rag.

7 fathoms from the lead—a red cotton rag.

10 fathoms from the lead—strip of leather with one hole.

(*Continued on page 58*)

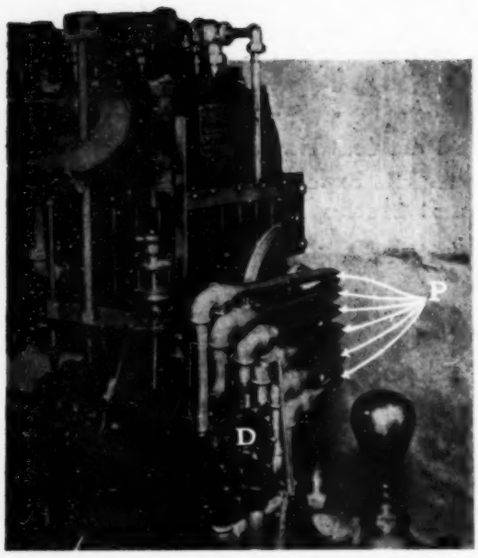


A 12 pound lead and line, marked in the approved manner.

Automatic Cranking

An Article Dealing With Electric and Compressed Air Self- of the Operating Qualifications

By Alfred L.



A compressed air system, using a distributor. D, the distributor; P, air-pipes leading from the distributor to the various cylinders.

FOR several years manufacturers of marine motors have been experimenting with self-cranking apparatus of various types, and although several methods employed have proven adequate and somewhat dependable, still the majority of designers and engineers have concentrated on but two varieties of automatic cranking devices: *i. e.*, (1) Electric, and (2) Compressed Air, or its equivalent.

Mechanical and chemical means of starting marine motors, especially motors of the larger sizes, have been worked out past the experimental stages by several manufacturers, but these methods have failed in the majority of instances to bring about any entirely reliable and positive system of self-cranking, and, consequently, have been abandoned.

It is not feasible to compare the merits and demerits of the automatic electrical starting systems with those of compressed air, for the reason that each type is particularly adapted to certain definite requirements. For instance, a compressed air system is especially adapted to large marine motors which are installed in small compartments, for the reason that the piping and valves and other controlling features of the system are practically a part of the motor and, consequently, take up little additional room in the engine compartment, and the pressure tanks may be placed in the bilge or other convenient place. On the other hand, electrical starters are well adapted to small, open motor boats.

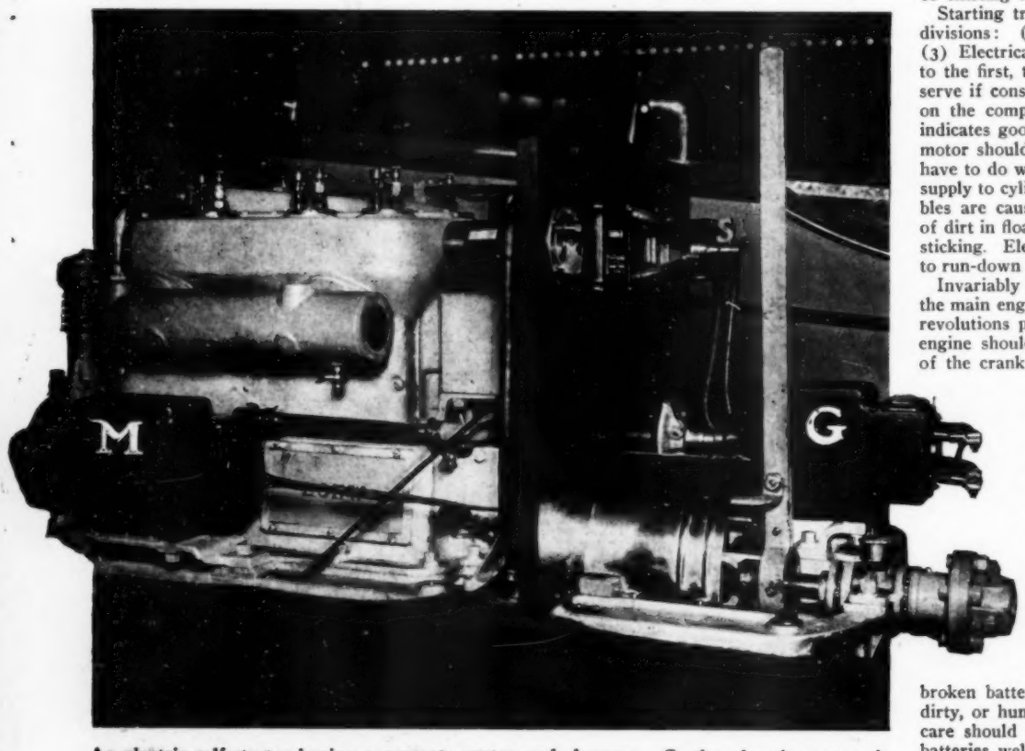
Irrespective of whether a gas engine is cranked over by hand, a mechanical device, or by some automatic means, there are certain preliminaries that should be attended to as follows: (1) Retard spark to avoid any possibility of backfiring superinduced through advanced spark. (2) Open throttle. (3) Turn on gas at carbureter. If the gasoline is fed by pressure, see that the gauge indicates a pressure of from two to four pounds. See that valves controlling circulating water are open. This is important and may prevent serious damage to motor. (5) See that all lubricators are full and adjusted. (6) Place ignition switch on battery and the motor is all ready to be cranked. The controlling features of electric self-starters usually consist of a push-button starting switch, which turns the current on the electric or cranking motor which, in turn, engages with and revolves the main engine, and immediately after the engine picks up its regular cycle the starting push-button should be released. This will cut the cranking motor out and save battery current. After engine starts, the source of ignition current should be changed from battery to magneto by placing switch on latter contact.

One of the chief advantages of an automatic starter lies in the fact that in the majority of cases it will start a cold engine without priming; but the fact must not be lost sight of that any engine troubles that will interfere with starting when hand-cranking is in order, will likewise result in a non-start of motors fitted with self-cranking devices. Therefore, if a motor is turned over by an auxiliary means and does not start within 30 seconds, this is, in nearly all cases, a positive indication of existing trouble.

Partial List of the Gas Engines Manufactured

EDITOR'S NOTE: The motors listed in this table represent the sizes listed are the only models made by the firms mentioned and it must not be conceded from the data presented.

Name of Motor.	Sizes equipped with self starters.	Type.
Anderson Engine Co. ..	Optional	Electric or Air
Automatic Machine Co.		Optional
Fay & Bowen Co.....	10 H. P.-70 H. P.	Electric
Buffalo Gas Engine Co.	85 H. P.-150 H. P.	Compressed Air
Campbell Motor Co....		Compressed Air
20th Century Motors...	50 H. P.-300 H. P.	Compressed Air
Doman Co., H. C.....	Optional	Electric
Elco-Bayonne.....		Electric
Harbeck Motor Co. ...	130 H. P.	Compressed Air
S. M. Jones Co. (Ralaco).	10 H. P.-30 H. P.	Electric
" " " " "	50 H. P.-75 H. P.	Compressed Air
Kermath Mfg. Co.....		Special to order
Leary Gasoline Co.....		Air or Electric
Loew Mfg. Co.....	25 H. P.-60 H. P.	Electric



An electric self-starter having a separate motor and dynamo. G, the electric motor, is geared to the crankshaft, turns over the engine until it picks up under its own cycle and causes M, the electric dynamo, to revolve and charge the storage battery.

Starting troubles may be divided into three divisions: (1) Mechanical; (2) Functional; (3) Electrical. To test for troubles peculiar to the first, turn motor over by hand and observe if considerable resistance is encountered on the compression strokes. This resistance indicates good compression; but otherwise the motor should turn easily. Functional troubles have to do with the fuel to carbureter and gas supply to cylinders. The chief carbureter troubles are caused by water or an accumulation of dirt in float chamber, or are due to the float sticking. Electrical troubles may be attributed to run-down batteries, dirty plugs, etc.

Invariably when the auxiliary motor turns the main engine over at a fair speed, say forty revolutions per minute for thirty seconds, the engine should start because the twenty turns of the crank shaft which have taken place in this period of time have caused fresh gas to enter each cylinder several times, and, consequently, the non-start is not attributable to the automatic starter. On the other hand, if on pressing the starting button, the engine fails to revolve, the trouble is due to some fault pertaining to the self-starter, providing, of course, that the load has been released from the engine; that is, that the clutch is in neutral position.

Troubles that affect electrical self-starters are: First, weak or depleted battery; second, broken battery or other circuit; third, worn, dirty, or hung-up commutator brushes. Great care should be exercised to keep the storage batteries well charged and each cell should be examined about every two weeks and the height of the electrolyte noticed. This solu-

Devices for Motors.

Starters and the Meritorious Features of Each System. Some of Self-Starters in General.

Brennan, Jr.

tion should always be high enough to cover the plates. A little pure water can be added without materially effecting the specific gravity of this fluid, but in cases where the level is quite low, due to accident or otherwise, the cells should be filled up with a solution composed of one part sulphuric acid and three parts of pure water. Storage batteries should be kept dry and care exercised to wipe off any of the acid that may be slopped or otherwise accumulate on top of the cells. This will eat up the copper terminals of wires, resulting in faulty circuits.

Which Are Equipped with Automatic Starters.

...at are equipped with compressed air or electrical start... listed in this table, that the sizes of the several makes ...listed.

Name of Motor.	Sizes equipped with self starters.	Type.
Murray & Tregurtha	Up to 40 H. P.	Compressed Air
Roberts Motor Co.	Optional	Electric
Scripps Motor Co.	Optional	Compressed Air
Standard Motor Const. Co.	125 H. P. and over	Compressed Air
Stanley Co.	2-15 H. P.	Optional
Speedway Engines	Large sizes	Compressed Air
Sterling Eng. Co.	All sizes	
Trebert Eng. Works		Compressed Air
Vanguard Eng. Co.		Optional
Waterman Marine Motor Co.	24 H. P.	Electric
Winton Gas Eng. & Mfg. Co.	60 H. P.-200 H. P.	Compressed Air
Wolverine Motor Works	Large sizes	Compressed Air

When charging storage batteries, always, if possible, charge at a low rate, because for the average 6-60 battery a charging rate of five amperes will give the highest operating efficiency and the longest life, the fact being always kept in mind that when the amperage rate (flow of current) is low, considerably more time is required to charge the battery.

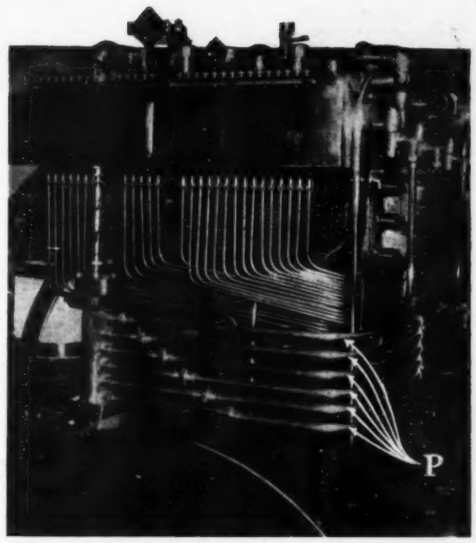
The most fruitful sources of trouble in connection with electric motors can be traced to the carbon brushes that contact with, and the commutator surfaces. These brushes are composed, in some instances, of small wires which are held apart by a non-metallic substance of a comparatively soft nature, thus readily coinciding with the commutator. Due to hard spots, brushes of this variety sometimes "hold up"; that is, contact on a very small area, and thus prevent the flow of an adequate amount of electricity to perform the full work, yet allow of a partial working. Carbon brushes are best adjusted by rubbing the contacts on a piece of flat paper, care being exercised to true up the end at right angles to its length. Brushes so treated will quickly wear sufficiently to thoroughly coincide with the commutator and insure a perfect connection. An accumulation of scale, dirt, oil or moisture on the commutator will also impair the motor's power output partially or entirely.

Dirty commutators should be removed and their surfaces and corresponding surfaces cleaned with fine sandpaper and then rinsed in gasoline. Although some authorities recommend emery cloth, still practice proves that sand paper is superior, inasmuch as loose particles of emery are a powerful abrasive and liable to cause partial short circuits. The armature bearings require constant lubrication; that is, the bearings should receive frequent additions of small amounts of oil, instead of greater amounts at extended periods of time. In cases where drive chains are used, these should be painted with heavy grease, graphite paste or non-fluid oil whenever they show signs of being dry. A similar lubricant should be used in the transmission. Non-starts are often attributable to loose or broken wires, and so in the event of trouble it is well to try the several connections.

In regard to air-starting devices, several systems have been worked out around the basic principle of using the force of compressed air to crank the motor. These systems are similar in principle, but differ somewhat in regard to the way the air is controlled or distributed.

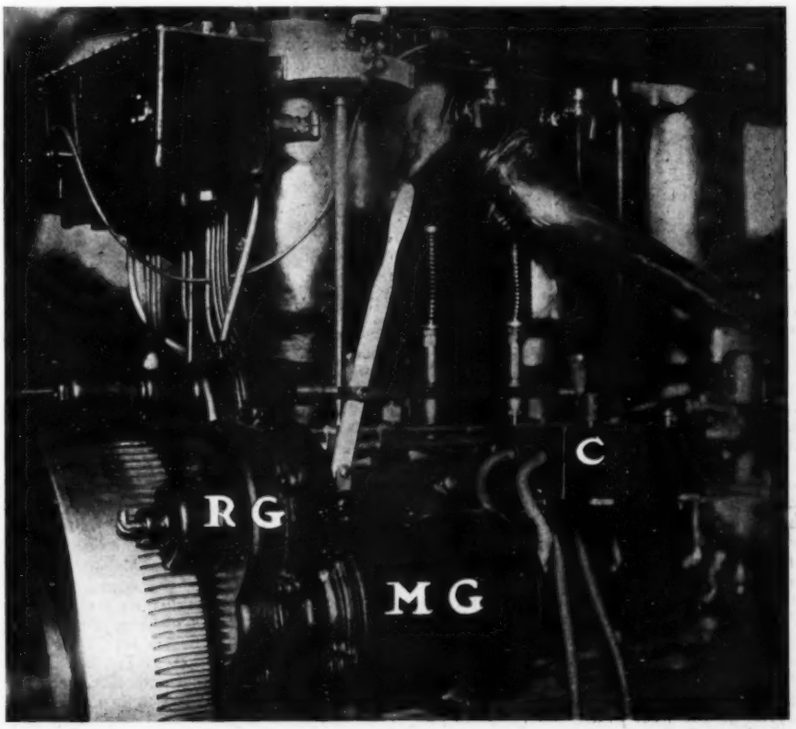
Some air-starting mechanisms are controlled by a distributor somewhat on the same principle as the plug in a gas engine is governed by a timer. While on others a direct valve system is used, the valves being controlled and operated by a movable half-time shaft which, when pulled out, causes a suitable cam to engage with the inlet compressed air valve-stems and causes the valve to open and admit compressed air to the cylinder last under compression, thus forcing the piston down, since both intake and exhaust valves are closed.

When the piston reaches the bottom center of the stroke, the air valve is closed, and a similar set of operations take place in the next cylinder in the order of firing. It will be noticed from this that the compressed air admitted to the cylinders in no way interferes with the mixture, for the reason that the air is not admitted to the cylinders until the pistons have passed the point of firing, and therefore the charge of gas contained in any cylinder was drawn in before the air was admitted.



Another form of air-starter. D is the distributor, and P, the air-pipes to the various cylinders.

This fact is mentioned to help eradicate the erroneous notion some possess that the compressed air is partly admitted during the intake stroke. Although the direct valve method is undoubtedly the best for large-sized motors, still practice has shown that a disc distributing valve gives excellent results on small-sized motors, this method being similar to the direct valve method insofar as the compression in the opposing cylinder is automatically released. This, in some respects, is quite a departure from electrical starters for the reason that they are called upon to revolve the engine against considerable compression, there being no means in the electrical appliances to automatically release this pressure as with the air starters, and, consequently, more power is required in the latter case.



Electric self-starter using a motor generator. In this system M.G. acts as a motor before the engine is working under its own power and a dynamo after the engine picks up. R.G. is the reduction gear between the motor generator and the fly-wheel.

Challenging Team for B. I. Trophy.

How the Postponement of the Events to September Tenth has Greatly Increased the Chances of the American Team. Two First-Class Boats Sure to Go to England and the Possibilities of the Third are Very Bright.

IN THE August issue of MoToR BoatinG, the story was told of the failure of the Motor Boat Club of America to make good in the selection of a team of three worthy challengers to send abroad to meet the English defenders and French team in competition for the British International Trophy, or, as it is sometimes called, the Harmsworth Trophy. This failure led the club to ask the Royal Motor Yacht Club of England for a postponement of a month, hoping that some of the really reliable and fast boats, which were holding back for the Toledo, Thousand Islands, Chicago and Keokuk Regattas, would demonstrate their worth at these events and thus qualify for a team which would, at least, not be a disgrace to this great motor boating country. Our English cousins showed their true sportsmanship by ordering a postponement to September 10th — a date sacred in American history, being one hundred years to a day when Commodore Perry, by his great victory on Lake Erie, sent that famous message, "We have met the enemy and they are ours."

This act of the Royal Motor Yacht Club demonstrates very clearly how keen the Englishmen are for a real race and not one by default. Their action is one which this whole country should appreciate.

The situation in regard to possible challengers to be sent abroad, as we set it at the time of going to press, is about as follows: Ankle Deep, owned by Count Mankowski, of Lake George, N. Y., is sure to go. This boat, without any question, is the most reliable, if not the fastest of any American hydroplane, although unfortunate enough to break two shafts in last year's international races, yet this experience gained by even this high cost has been judicially taken advantage of and Ankle Deep is 100% better than she was at that time. Her owner has repeatedly said he would be willing to take his craft abroad if the dates could be arranged so that the English races would not conflict with the Gold Challenge Cup events on the St. Lawrence. This could not be arranged before the postponement was effected, and as the Count had given his word to represent his Lake George Club in their efforts to bring the cup to the inland lake, he naturally refused to be counted upon to bring back the Harmsworth Trophy. In his Gold Challenge Cup efforts he was remarkably successful, the cup on which his heart has been set for two years was won by Ankle Deep under his own helmsmanship, and her performances were most consistent and uniform. While not pushed to any extent whatsoever, he was able to win each day's event by more than two minutes over the second boat to finish, and his greatest variation for any day's run of 29.3 statute miles was less than two minutes. While her speed was naturally not remarkable, yet it was at the rate of over 38 miles per hour for the entire course, and for one lap on which she was let out to show a little of her possibilities, the official time shows just 45 miles an hour. This may not appear very large in print as compared with the much-heralded 60 and 70 miles this year, yet when one remembers that the winner's best time in last year's international races was only at the rate of 43.3 statute miles per hour, the full significance will be realized. Ankle Deep is even capable of greater things than this, for in the mile trials at Cold Spring Harbor, Long Island, conducted by Commodore Blackton this spring, over a course whose accurate length is beyond question, she averaged 47.14 miles per hour for the six consecutive runs. If such speed could be maintained abroad for the 30 miles, and there is every indication that it can be, then it seems probable that the visit of the trophy to English waters will be short lived.

As is well known, Ankle Deep is a 32-footer, designed by Tams, Lemoine & Crane, of New York City, built by the Staten Island Shipbuilding Company, and is powered with two 150-180 h.p., eight cylinder, 5½ inches by 6¾ inches racing engine. Although this is her second season and her record of 1912 was not remarkable, due to a series of unfortunate accidents, yet the committee could not make a wiser move than to select this boat.

The second choice for the team should be Kitty Hawk V, provided a few ifs can be eliminated. She is fast enough beyond all question and owned by one of the most enthusiastic sportsmen of to-day. Her performance on the Maumee River, at Toledo, was an eye-opener to everyone, and it is to be regretted that her owner did not put her in more of the events so that her reliability qualities could be tested to greater advantage. He chose to hold her for the last of the seven events, for which she was eligible—the Perry Centennial Free-for-All, not caring to risk the chance of accident in the less important heats. In the race in which she did take part—a 30-mile race with three laps of ten miles each, she won, hands down, with no second boat of the same caliber to push her. Kitty Hawk V's first lap of ten miles was at the rate of 47.2 miles an hour; she then chose to take things more easily, finishing the 30 miles at a rate of 43.6 miles per hour without trouble.

Kitty Hawk's plans for the future are somewhat in doubt. She is entered for the Chicago races scheduled for Aug. 18th to 23d, and her performance at these races will determine what course her owner will pursue in regard to allowing his boat to go abroad.

Judging from the speed of over 47 miles per hour made in the one ten-mile lap, the only lap in fact in which her drivers had reason to open her engines up a bit, there should be little reason to doubt that the boat has the necessary speed to bring the Trophy home. Furthermore, her designer, John L. Hacker, emphatically stated after the above performance that speed better than 55 miles an hour had been obtained with his boat in her unofficial trials.

Kitty Hawk V is a 26-foot single step hydroplane, owned by H. H. Timken, Canton, Ohio. She is powered with one 12-cylinder, 5½ by 6 inch, four-cycle Van Blerck motor of 250-300 h.p. Her weight complete, without crew, is in the neighborhood of 3,400 pounds, the hull alone weighing about 1,400 pounds. Thus Kitty Hawk V is not an exceptionally light boat for her power, as this figures out approximately 12 pounds per horsepower. Her wheel is a Harthan of 46-inch pitch, being turned at a ratio of 1 to 1¼ by a motor making nearly 1,800 revolutions per minute. It is earnestly hoped that this boat's performance at Chicago will be of the highest order and occasion will present itself to make Kitty have to open up to her full capacity in order to show in an official trial just what she is capable of. If this does happen and she proves her worth, we believe her owner, Mr. Timken, will arise to the occasion and send her abroad.

The above easily and decisively disposes of the first two positions on the American team, but for the third, sailing is not so smooth. There are several boats which are possibilities, but each has its fault, which would seem to eliminate them from serious further consideration. In the first place, all authorities seem to agree that it is beyond reason to expect any reliability from any boat of less than 26 feet in length on account of the character of the water at Cowes. There are days when the water is smooth as on any of our rivers but these are few and far between, and the lesson learned at Huntington last year, when the second day's races were sailed on the tail end of a Northeaster, settled this question once for all. Similar conditions prevail at Cowes.

Aside from this fact there are three twenty-footers of exceptional note, all of which have given a good account of themselves so far this year.

Baby Reliance II, owned by Commodore J. Stuart Blackton, a new hull, but closely resembling the boat of the same name which cleaned up nearly everything in sight last year, with a 150-180 h.p. Sterling motor, was credited with 45.1 miles per hour at Toledo in a ten-mile race. Hazel II, a 20-footer, built and designed by Elco-Bayonne and owned by A. E. Smith, ran at Toledo at a 43.2 mile rate; and Kitty Hawk, Jr., another Hacker hydroplane, powered with a six-cylinder 125 h.p. Van Blerck, had no difficulty in performing in several races at over 42½ miles per hour. Kitty Hawk, Jr., like her bigger sister, is also owned by Mr. Timken.

Passing on to the larger boats we find Baby Reliance III, owned by Commodore Blackton, which started off in an awful hurry at Toledo, but came to grief before the finish, so her real possibilities are unknown. This boat is powered with one of the two 6-cylinder Pierce-Budd motors removed from Speed Demon Reliance. P. D. Q. III, owned by Alfred Graham Miles, once thought of as a probability, is hardly in this class as the recent races on the St. Lawrence showed her best speed to be under 40 miles.

Neptune II, owned by Lawrence Buhl, of Atlantic City, has been spoken of considerably but to date has done nothing worthy of note. She is equipped with a special 6-cylinder motor of enormous power, the first of its kind ever built, and there are many construction details which are far from perfect yet. Every effort is being made to overcome these and should her builder be successful, everyone feels sure that Neptune will give a most excellent account of herself.

Of the larger boats there is just one 40-footer in this country today which every motor boating enthusiast is watching with the greatest interest. This boat is Disturber III, owned by Commodore James Pugh, of Chicago. Her future, like Kitty Hawk V's, depends upon her showing at Chicago. She is a 5-step Fauber design, powered with two 12-cylinder Van Blerck motors, each capable of developing close on to 300 h.p. This boat has not been given any official trials as yet this year, but the reports of her unofficial ones are very encouraging. Last year at Chicago she did only fair, due in part to her engines being new.

These have been entirely rebuilt and if they will deliver all that is claimed for them we may expect something to happen. If this does —well, we know of no better choice for the third boat in the team.

America, Commodore Blackton's sea sled, seems to be almost out of the running this year. She has great possibilties before her and a very systematic line of experiments are being tried out on her, but the principle is too new and the theory too complicated to be grasped in one short month.

Summing up: We find as a sure choice, Ankle Deep, owned by Count Mankowski of Lake George, New York, powered with two 150-180 h.p. Sterlings; second choice—a little more doubtful—but a good one if her owner permits it—is Kitty Hawk V with her 12-cylinder 300 h.p. Van Blerck motor.

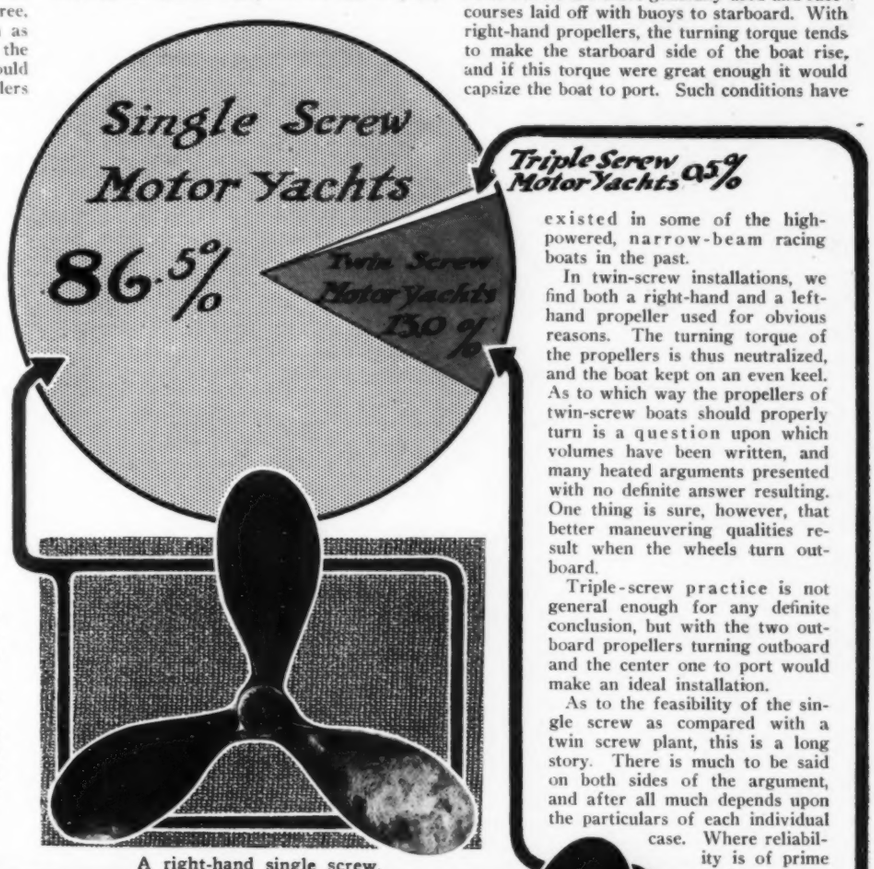
As to third choice, we hold up our hands—but eliminating the 20-footers—we might draw from a hat any one of the names of Disturber III, Neptune IV, or America, and secure as logical a choice as conditions at the present time seem to warrant.

Single, Twin and Triple Screws.

The Relative Popularity of the Three Systems of Propulsion and the Various Combinations of Right- and Left-hand Propellers.

AT FIRST thought it is very natural for one to be of the opinion that a study of the three systems of propulsion, as to the existing numerical division of the three, would only result in what might be taken as granted or a foregone conclusion. That the extreme popularity of the single-screw would far outshadow the boat with twin propellers and that even a trace of the triple-screw boat would not be evident seems to be the general opinion. Such conclusions would be far from the correct answer to the problem, as the illustrations on this page clearly indicate.

On this particular point, of 1,800 motor yachts of 30 feet in length and over which we have examined to ascertain the relative popularity of each system, we find that only 86.5% of them are equipped for single-screw propulsion, while the twin-screw, which one would hardly allow 5% importance without an actual study shows up remarkably strong. Thirteen per cent. of the motor yachts whose specifications we looked into called for twin screws.



The relative areas of the sectors represent the division of three types of propulsion into which all American motor yachts fall.

Power plants of the triple-screw variety one seldom hears of, yet they are in existence and not alone either for one-half of one per cent., or one motor yacht in every two hundred which one meets on Nature's highways is fitted with a triple-screw propulsion.

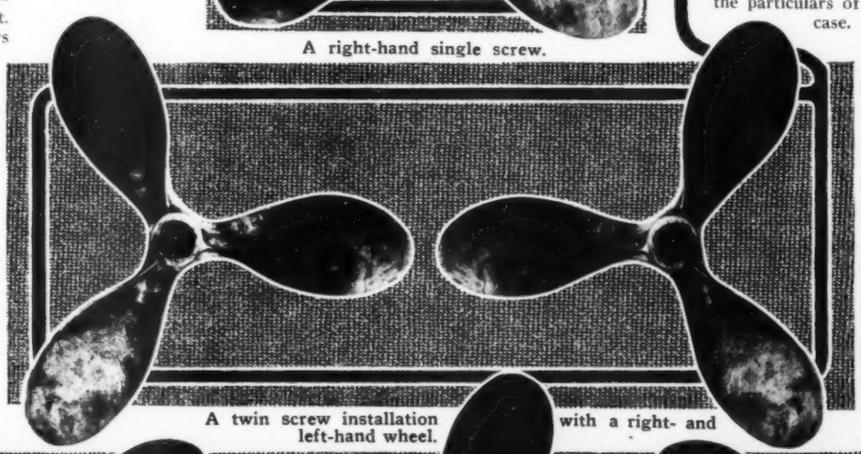
Here also are shown the right- and left-hand propellers, compared. In the single-screw plant in this country we find the right-hand propeller almost universally used; that is, one whose upper half turns to the right, looking at it from the rear, or turns toward the starboard side of the boat. Right-hand propellers cause the bow of the boat to tend to work to port or gives the boat what is sometimes called a "lame side." To offset this, a port helm must be carried to keep the craft on her course. For the same reason, a boat with a right-hand wheel maneuvers much more easily to port than to starboard and will turn much sharper in this direction. This is one reason why race-courses in this country are laid off with all buoys to the left to port, as it assures a much shorter turn. Practice in England is the reverse of that here and left-hand wheels are more generally used and race-courses laid off with buoys to starboard. With right-hand propellers, the turning torque tends to make the starboard side of the boat rise, and if this torque were great enough it would capsize the boat to port. Such conditions have existed in some of the high-powered, narrow-beam racing boats in the past.

In twin-screw installations, we find both a right-hand and a left-hand propeller used for obvious reasons. The turning torque of the propellers is thus neutralized, and the boat kept on an even keel. As to which way the propellers of twin-screw boats should properly turn is a question upon which volumes have been written, and many heated arguments presented with no definite answer resulting. One thing is sure, however, that better maneuvering qualities result when the wheels turn outboard.

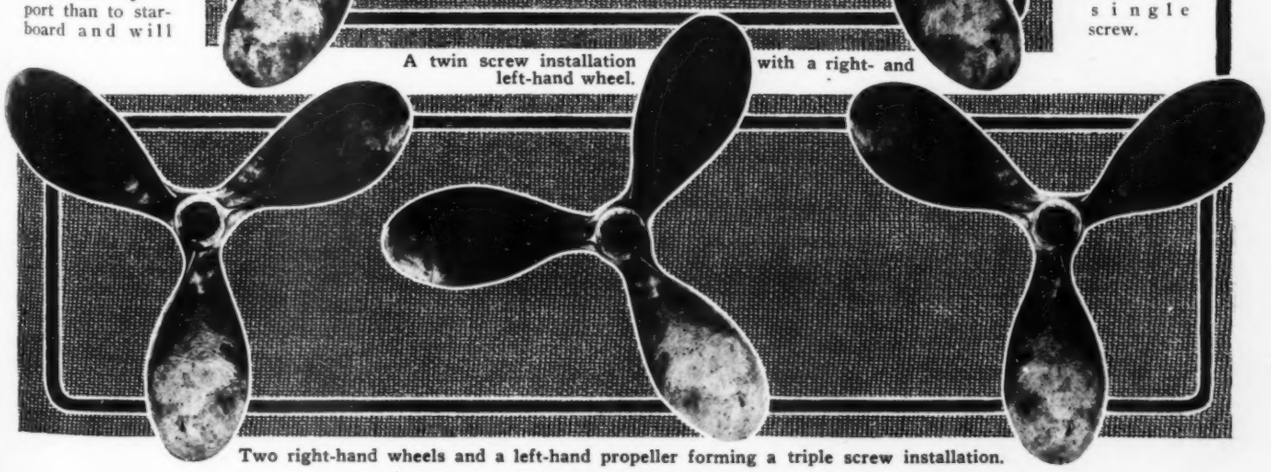
Triple-screw practice is not general enough for any definite conclusion, but with the two outboard propellers turning outboard and the center one to port would make an ideal installation.

As to the feasibility of the single screw as compared with a twin screw plant, this is a long story. There is much to be said on both sides of the argument, and after all much depends upon the particulars of each individual case. Where reliability is of prime importance, then the twin screw boat has many points in its favor but if propeller efficiency is sought alone, then the balance of the best choice leans strongly toward the single screw.

A right-hand single screw.



A twin screw installation with a right- and left-hand wheel.



Two right-hand wheels and a left-hand propeller forming a triple screw installation.

NEW - MOTOR - BOATS

A 1914 Sixty-Five Foot Cruiser.

A SIXTY-FIVE footer with two double staterooms, one single stateroom and a bathroom forward in addition to a large main cabin, separate galley and toilet room aft, with a large well ventilated engine room in the middle of the boat is worth a little study if you are interested in cruising motor boats.

The design is from the office of Bowes & Mower for one of their clients whose requirements called for a sixty-five by fourteen foot boat with the above accommodations, and as much usable deck room as possible. The design shows the great amount of study and practical experience which this firm of designers has given to modern motor cruisers, and it would be difficult to improve upon this design in any detail of arrangement or appearance. The boat will also be a good sea boat, easily driven and comfortable for either inland or offshore cruising.

The boat is a departure from the usual raised deck type, as she shows a clean, unbroken sheer, with good freeboard forward and a graceful sweep to the stern. This gives the boat a clean cut, handsome appearance that is impossible with the broken sheer lines of the typical raised deck cruiser, and will appeal to the yachtsman whose eye has been trained to a handsome sheer and good lines of hull. The stem is straight with full deck lines, giving a nicely worked out flare to the forward sections and a fine entrance at the waterline. The stern shows the modern curved transom with outboard rudder, which not only looks well, but is the most practical arrangement for the steering gear.

The deck houses are low and well proportioned and arranged so that they serve their purpose with as little obstruction to the deck space as possible. The after deck is 10 feet long, with a grating forming a seat over the steering gear, at the aft end, and ample room for deck chairs. The side decks are wide enough to allow easy passage forward to the bridge deck, which is on the main deck level and very roomy. The wide bridge deck seat is on top of the low engine room trunk. This deck arrangement allows a continuous, unbroken awning, which makes less top hamper and adds greatly to the appearances. The funnel is placed over the engine room and takes the engine exhaust and galley stovepipe, besides providing ventilation for the engine room. A boat will be carried on davits and swing in on top of the after cabin when necessary.

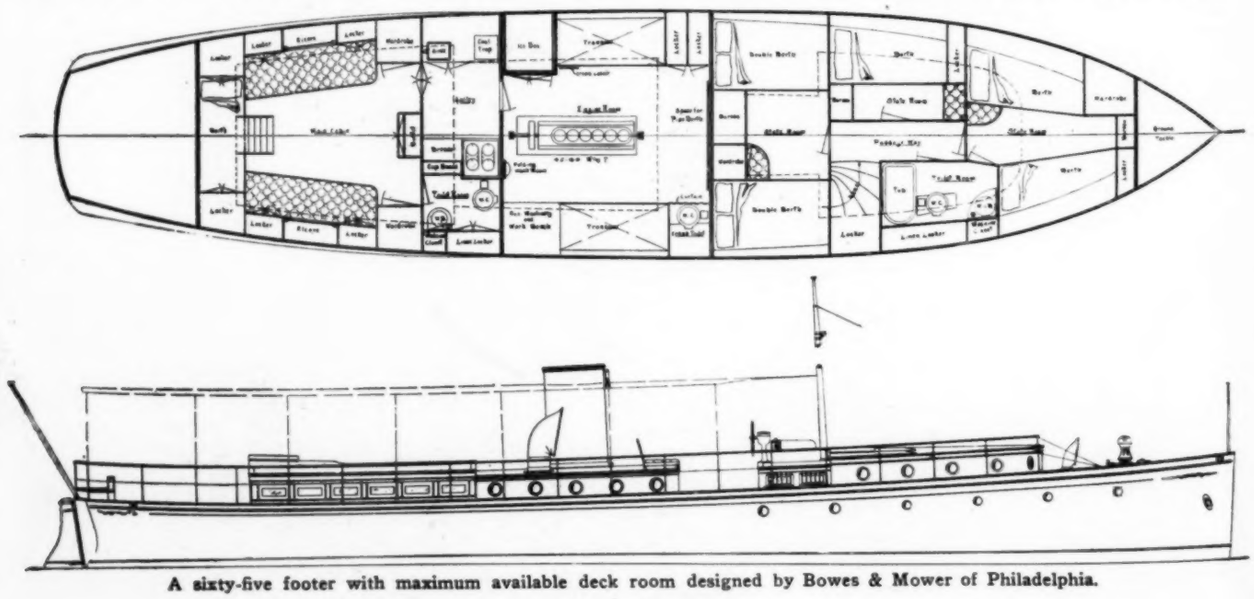
The main cabin is reached by the companion way from the after deck and is 12 ft. 6 in. long, with wide transoms on each side and an athwartship berth at the aft end. At the forward bulkhead there are two large wardrobe closets and a sideboard at the center. Back of the transoms are alcoves and lockers for books, etc. The toilet room is on the starboard side just forward of the cabin and contains wash basin, water closet, linen locker, and a well equipped medicine closet. The galley is on the port side occupying a space of 4 ft. 4 ins. between bulkheads. The stove and a dresser with locker for pots and pans under and dish lockers over are on the inboard side, and the sink and dresser are on the outboard side. The ice chest is placed in the engine room, where there is less heat than in the galley and is arranged so that it can be conveniently filled through the engine room hatch. While very compact in its arrangement, the galley is large enough for a boat of this size. The location of the galley allows the steward to reach it without going through any of the owner's quarters and he is able to serve his meals both to owner and crew without any inconveniences.

The staterooms are forward, separated from the engine room by a double watertight bulkhead, which will be practically sound-proof. The companion way has a curved stairway landing in a passageway from which the three staterooms are entered. The owner's room is just forward of the engine room and has two double berths, a wardrobe, bureau and large drawers under the berths. There is a double stateroom forward with two single berths, wardrobe, locker and bureau. This room has direct access to the toilet room. On the port side is another single stateroom, and opposite it is the toilet room, fitted with bathtub, wash basin, water closet and the usual linen locker and medicine chest. The staterooms are all large, with good headroom, and are not cramped up as would at first seem necessary to get this amount of accommodations.

The engine room is located amidships, where it should be to give proper performance of the boat, and is 11 ft. 6 ins. long, with double watertight bulkheads at either end. The engine is a six-cylinder, 60 h.p. Murray & Tregurtha, which will give a cruising speed of between twelve and thirteen miles per hour. There are two fixed transoms for the crew and space is provided for a pipe berth in case a third hand is carried. There is a crew's toilet in the engine room and two separate clothes lockers for the crew.

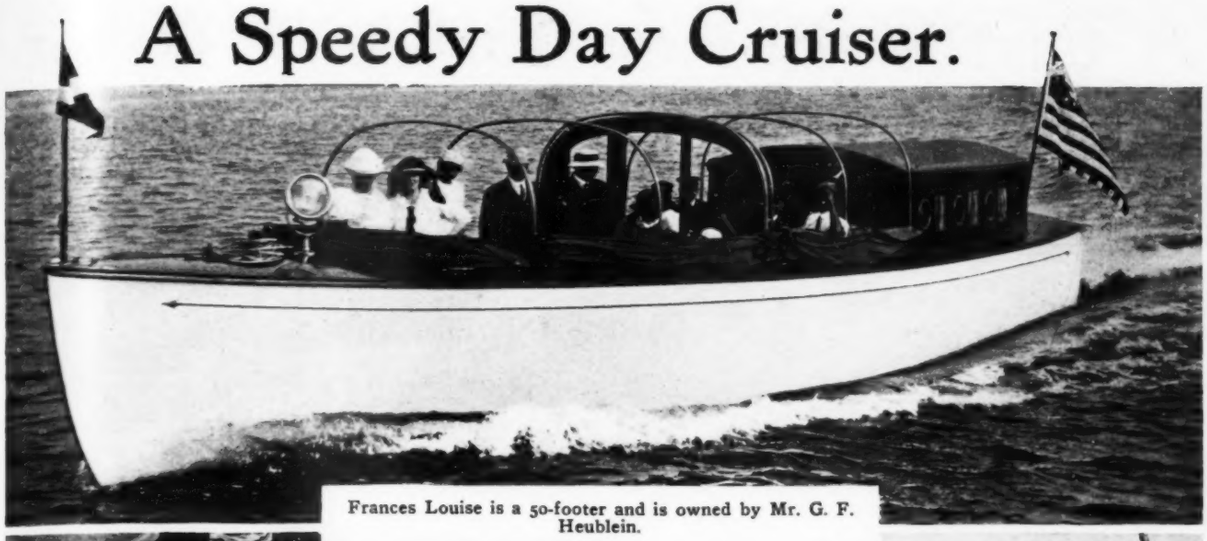
The auxiliary machinery and work bench are located on the starboard side at the after end. Engine room telegraphs will be fitted on the bridge. Of the construction little need be said, as the reputation of the designers assures a strong, well constructed hull with every detail carefully worked out.

The finish of the boat will be mahogany and white enamel below and the outside joiner work will be teak. The hull will be black with a white boot top and green underbody and the deck houses will be painted white pine with teak window sash and mouldings. The engine room trunk will be teak with heavy brass ports. The boat will be a handsome addition to the motor boat fleet, and her appearance next season will be watched with interest.

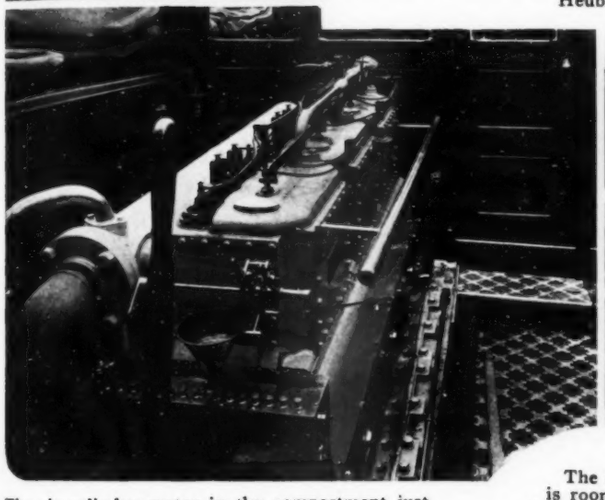


A sixty-five footer with maximum available deck room designed by Bowes & Mower of Philadelphia.

A Speedy Day Cruiser.

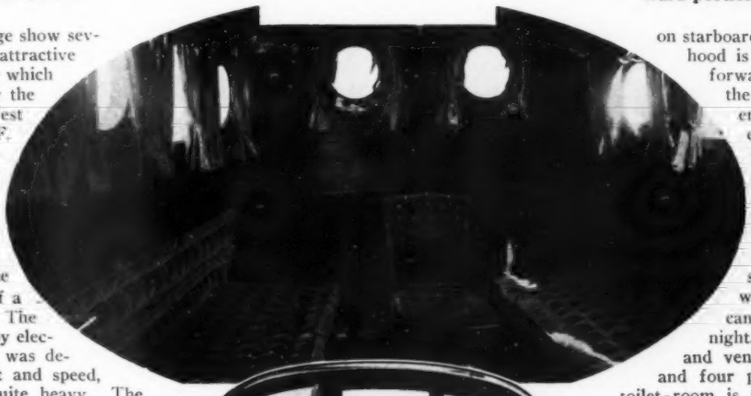


Frances Louise is a 50-footer and is owned by Mr. G. F. Heublein.



The six-cylinder motor in the compartment just forward of the cabin.

The comfortable cockpit which comprises the forward portion of the boat.



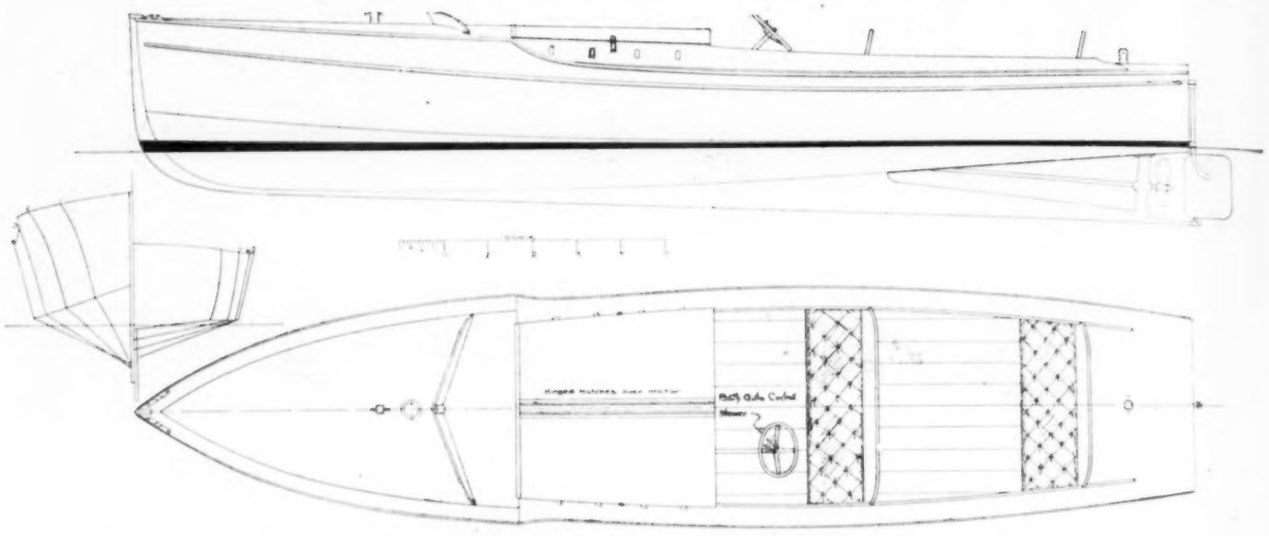
The cabin is roomy and daintily fitted out.

THE pictures on this page show several views of a very attractive high-speed day cruiser which was recently constructed by the Holmes Motor Co., of West Mystic, Conn., for Mr. G. F. Heublein. The general dimensions of the boat are: Length overall, 50 feet; length on load waterline, 48 feet 3 inches; beam extreme, 8 feet 3 inches; draft, 3 feet 1 inch. The motive power consists of a 6-cylinder Holmes motor. The boat is lighted throughout by electricity. Although the boat was designed to combine comfort and speed, still her construction is quite heavy. The keel is oak in two lengths with scarf 36" long, securely fastened with copper bolts, riveted over copper washers; stem is of oak of natural crook; stern, natural crook, hackmatack knee. The stern is framed up with oak, and planked with 1¼" mahogany. The frames are fairly heavy and spaced 8" centers. The planking is of 1½" yellow pine. The forward cockpit is divided by a bulkhead having large glass windows and door on starboard side. An improved spray hood is fitted to cover either the forward or after sections of the cockpit. This convenience makes the boat very comfortable during bad weather. The forward cockpit is fitted with large, easy chairs, which prove decidedly more comfortable in a boat of this type than stationary seats. The cabin is fitted with extension seats, which can be used as berths at night. The cabin is well lighted and ventilated by three windows and four ports on each side. The toilet-room is partitioned off, the washbasin being connected to the fresh water tank. Spark and throttle controls and reverse levers are placed on after end of motor, and also in forward cockpit, so that the motor may be handled by the steersman, as well as in the motor department.

The engine is a model H, 60-70 h.p. Holmes 6" bore by 9" stroke with regular equipment.

Looking aft, showing glass bulkhead between the cockpit at engine compartment.

A Fast V-Bottom for Open Water.



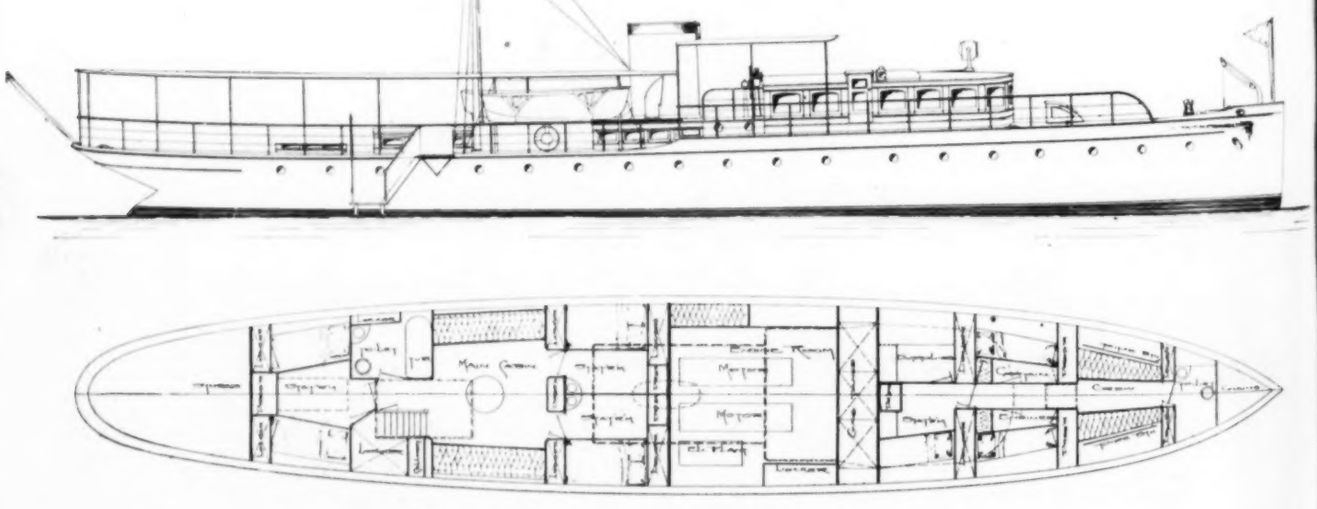
Plans of 24-foot V-bottom runabout, combining comfort and speed.

ONE of the most popular of the Bath V-boat models, built by the Bath Marine Construction Company, of Bath, Maine, is shown in the accompanying plan, and her general dimensions are length, 24 feet; beam, 5 feet. This particular boat was built for Mr. Gaston M. Dethier, who summers at Blue Hill, Maine, where the boat was delivered by her builders early this summer. The boat is powered with an 11 h.p. Ferro engine, which is placed forward under an engine hatch; a partial bulkhead aft of it separates the engine compartment from the cockpit. This partial bulkhead is carried up to underneath the coaming, so that although it keeps the dirt of the engine room separate from the rest of the boat it does not interfere with a person going forward to make adjustments or clean up the engine. An automobile steering wheel is attached to this bulkhead with central lever controls, connected with spark and throttle. This in conjunction with a reverse gear allows easy control. Although this boat was designed and built primarily for seaworthiness and is heavily constructed throughout, she will maintain, it is said, a speed of 11¼ miles per hour.

An Able Coastwise Cruiser.

BELOW are shown the plans of a 98-foot motor yacht from the board of the Matthews Boat Company, of Port Clinton, Ohio. The boat has a beam of 16 feet and a 6-foot draft. In fact, the draft is a little more than on the average motor yacht of her size, as the boat is designed for comfort and to have the best seagoing qualities. Speed is a secondary consideration, although the builders expect the boat to obtain a speed of 15 miles per hour. The arrangements below are very complete forward, ample crew's quarters are provided, immediately aft of which are the gasoline tanks enclosed between watertight bulkheads. The engine room is complete in every detail, the power equipment consisting of two 100 h.p. motors and a complete electric lighting plant. The motor room is steel lined throughout, with steel watertight bulkhead at the after end. The owner's quarters are arranged aft and give very satisfactory accommodations and a layout that is comfortable and practical. Forward of the main cabin are two large staterooms, fitted with double beds, lavatories, lockers and dressers. The dining saloon is arranged in the large deck house forward and is attractively finished in African mahogany.

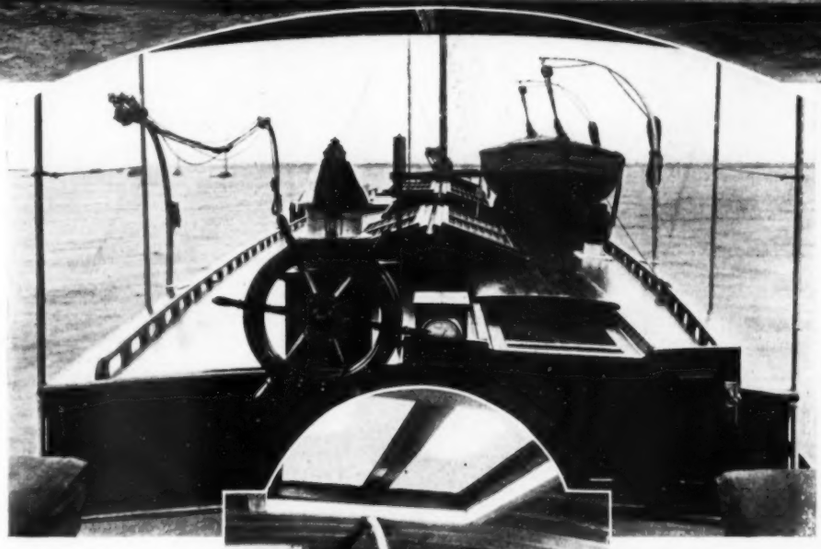
A signal mast is carried and is equipped with an electric mast head light. The binnacle and running lights are also electric. A large chart table is fitted on top of after forward house, the charts being protected in bad weather by a piece of heavy plate glass. Two boats will be carried, a small rowing tender and a high-speed motor tender; provision is also made to carry one or two duck boats or canoes on deck, in case the owner intends to go on extended shooting trips. A notable feature of the boat is the large amount of deck space available, the boat being of the flush deck type.

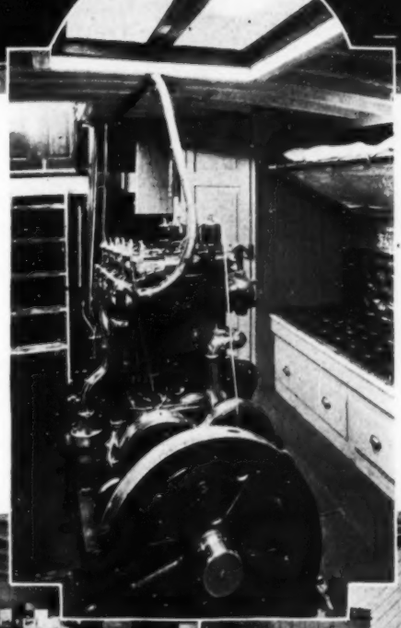


Plans of a 98-footer designed by the Matthews Boat Co.

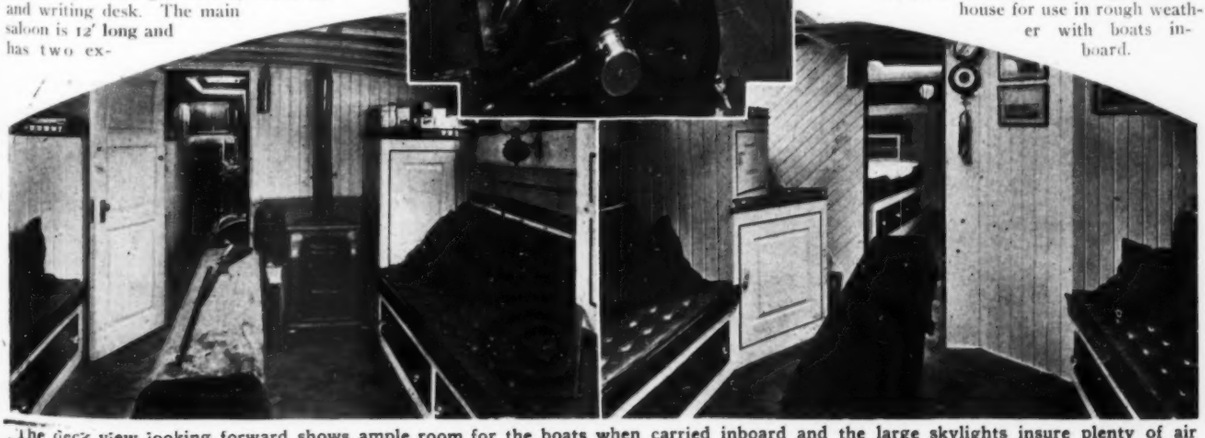
PONCE—a Boat for Gunning

PONCE, a fifty-nine-footer, owned by Mr Philip F. Du Pont, was recently completed by the Essington Shipbuilding Company, Ltd., from designs by J. Murray Watts, and has the following dimensions: Length overall, 59′; length waterline, 55′; beam, 12′, and draft 2′9″. Mr. Du Pont's requirements called for a very heavily built, fast and seaworthy craft in which to go gunning in Chesapeake Bay, South Carolina and Florida. The planking is 1⅞″ cedar, sheathed with ⅛″ copper, and the rest of the construction is correspondingly strong. A special 50-60-h.p. Harris engine turns up a 34″ diameter by 44″ pitch propeller 450 r.p.m., giving a sustained sea speed of 12 miles. On account of the shoal water on the flats where the best gunning is found, it was necessary to keep the draft very low. The propeller runs in a tunnel and is protected by a heavy metal skeg. The total draft is 2′-9″. Special 10″ ports are fitted, having plate glass ¾″ thick. To obviate the danger of fire, gasoline tanks are carried on deck, firmly fastened in deck boxes with cushions on top to form seats. The arrangement below decks is unusually comfortable, having been laid out to meet the owner's special requirements. The owner's stateroom is forward and is 12′ long and contains a full-size brass bed, a lounge, bureau, wardrobe and writing desk. The main saloon is 12′ long and has two extension transom seats which pull out to form berths. There is a fireplace with a Franklin stove installed at the after end of the saloon which is a much-appreciated comfort for hunters in winter time. There is a gun locker in the saloon holding a dozen shotguns and ample locker-room for ammunition, gunning coats, boots, etc. The finish in the owner's quarters is of mahogany, and in the engine-room, crew's quarters and galley, brown paint. The headroom varies from 6½′ to 7′. There is a toilet-room with hot and cold water, between the stateroom and the saloon.





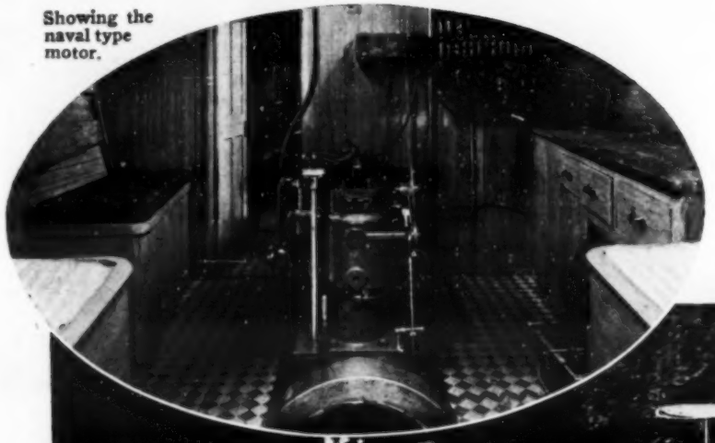
The engine-room is 13′ long and gives plenty of chance to work around the big motor. On the starboard side aft is a galley with a Shipmate range and hot-waterback, and on the port side are the crew's quarters, with two berths, lockers and separate toilet-room. The after hold is unusually large, being 11′ long, with a 4′ hatch opening into it, giving lots of room for decoys, heavy stores, spare cables, etc. The boat is steered and controlled from a position just aft of the trunk-house, which gives good protection to the helmsman. The rudder is arranged so that a spare tiller can be instantly slipped into place should anything go wrong with the steering gear. Two small boats are carried on davits during fair weather. Boat cradles are placed on top of cabin house for use in rough weather with boats inboard.



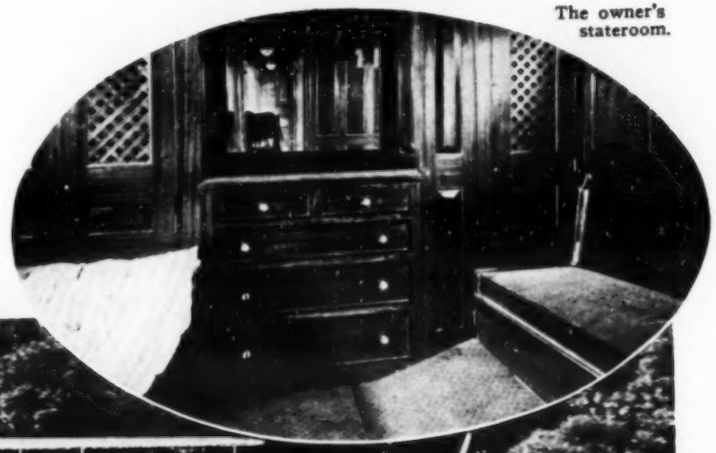
The deck view looking forward shows ample room for the boats when carried inboard and the large skylights insure plenty of air and light. The motor is accessible from all sides in the spacious engine room. The Franklin stove and ammunition locker are shown in the lower left-hand picture (looking aft in the main cabin); the other view (looking forward) shows the extension berths in the roomy cabin and a glimpse of the owner's stateroom.

SISPUD II.

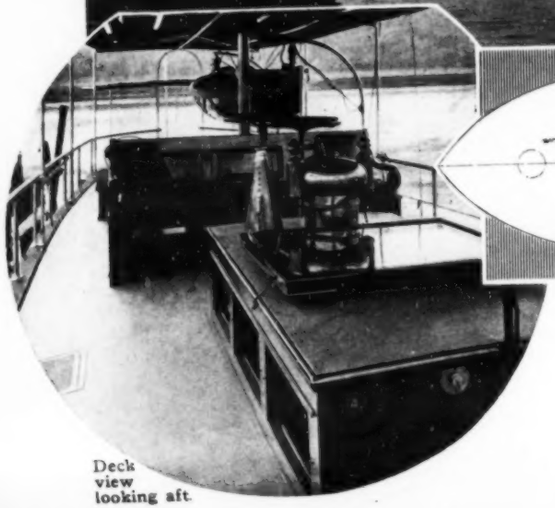
Length overall .....60 ft.
Waterline length .....54 ft. 9 in.
Beam .....12 ft.
Draft .....3 ft. 6 in.
Motor .....4 cyl. 50 h.p. 20th Century
Owner .....Mr. J. B. Cousins
Designers and builders.. N.Y.Yacht, Launch & Engine Co.



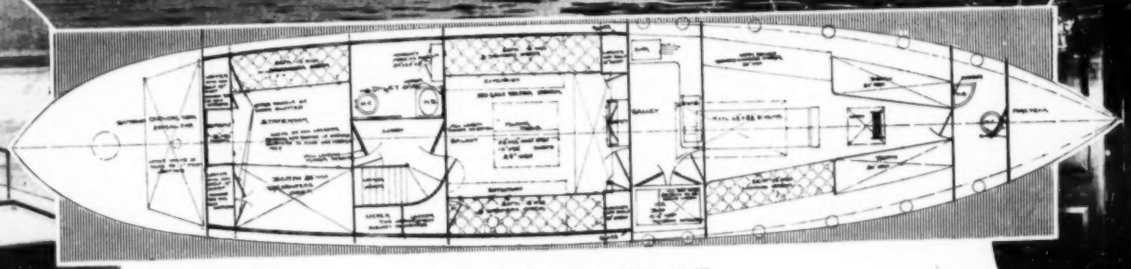
Showing the naval type motor.



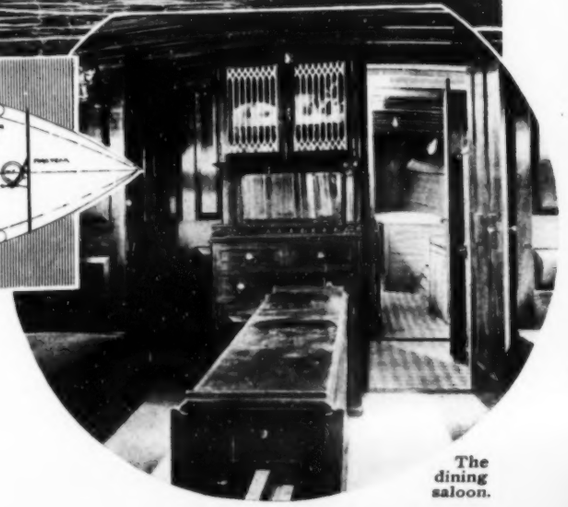
The owner's stateroom.



Deck view looking aft.



Accommodation plan of Sispud II.



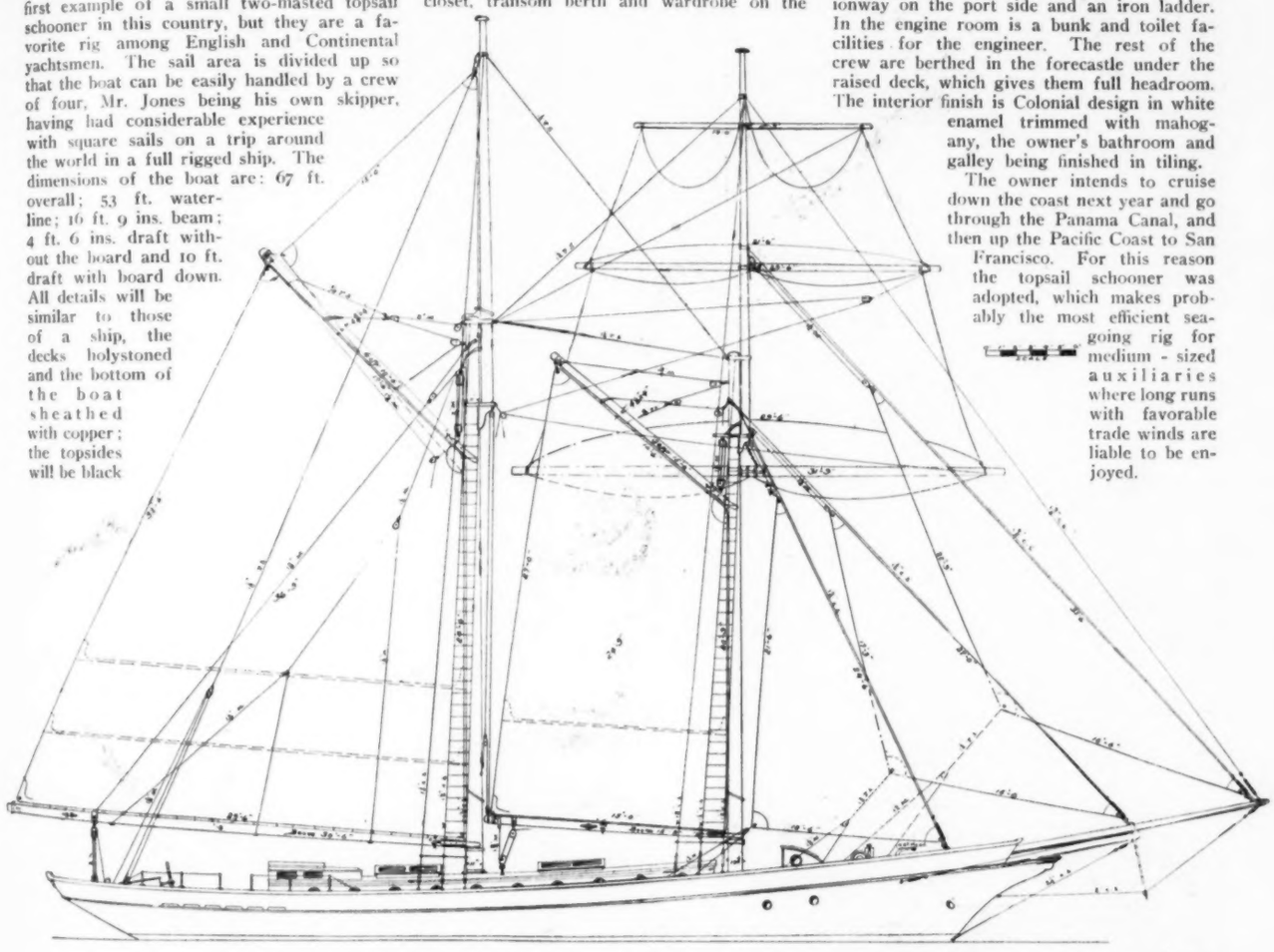
The dining saloon.

THE New York Yacht, Launch & Engine Company, of Morris Heights, N. Y., have recently delivered to J. B. Cousins, Esq., a 60-footer, which has been christened Sispud II. The boat is powered with a 4-cylinder 20th Century motor, having 6½ in. bore by 8½ in. stroke. The boat offers unusual accommodations for her size. The engine-room and crew's quarters are well forward. The galley is situated aft of engine room and is four feet long and extends the full width of the boat. The main saloon is very roomy and is fitted with large folding table, etc. The space between saloon and owner's stateroom is given up to a lobby on the starboard side and to a bathroom on the port side.

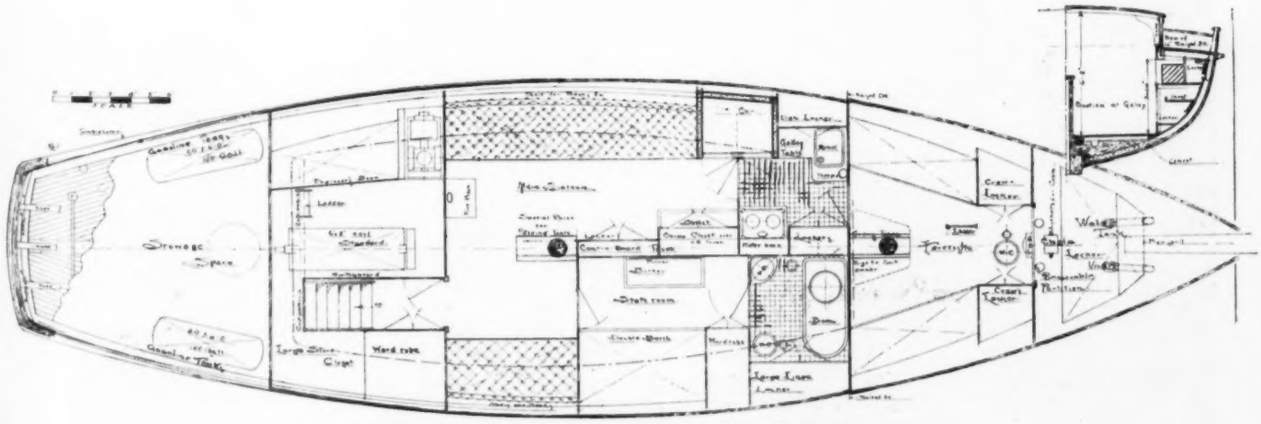
A Topsail Schooner Auxiliary.

THE accompanying plans show an interesting type of auxiliary schooner now under construction for Mr. Marshall Jones, Jr., of Pittsburgh, by the Smith & Williams Company, Salisbury, Md. The plans were drawn by J. Murray Watts. The owner called for a boat that could be used in the summer time in rather shoal waters around Chesapeake Bay and Delaware Bay, and for this reason the draft was kept down to four feet six inches, and a centerboard model used. In the winter Mr. Jones proposes to cruise throughout the West Indies. This is the first example of a small two-masted topsail schooner in this country, but they are a favorite rig among English and Continental yachtsmen. The sail area is divided up so that the boat can be easily handled by a crew of four, Mr. Jones being his own skipper, having had considerable experience with square sails on a trip around the world in a full rigged ship. The dimensions of the boat are: 67 ft. overall; 53 ft. waterline; 16 ft. 9 ins. beam; 4 ft. 6 ins. draft without the board and 10 ft. draft with board down. All details will be similar to those of a ship, the decks holystoned and the bottom of the boat sheathed with copper; the topsides will be black relieved by a gold stripe, and there will be a figurehead and scroll work under the bowsprit. The boat is an auxiliary and is equipped with a 37 h.p. Standard motor. There is a 1 k.w. Fay & Bowen electric light plant which furnishes current for the lamps, for the searchlight, and for the small electric motor driving a 3-cylinder plunger pump used for a fire pump or washing down decks. Probably the most interesting part of the boat is the arrangement which gives unusually good accommodations for both owner and crew. There is a large main saloon with a store closet, transom berth and wardrobe on the starboard side and two transom berths on the port side, a tiled fireplace aft and a buffet and private ice box forward. There is a stairway and companion leading on deck from the after end of the cabin and from the forward end a door leads into the galley, which is furnished with an ice chest, coal range with hot water back, and the usual plumbing. The owner's quarters consist of a roomy stateroom with a double berth, having a wardrobe and bureau and communicating directly with a large bathroom. The engine room is aft and is entered by a companionway on the port side and an iron ladder. In the engine room is a bunk and toilet facilities for the engineer. The rest of the crew are berthed in the forecastle under the raised deck, which gives them full headroom. The interior finish is Colonial design in white enamel trimmed with mahogany, the owner's bathroom and galley being finished in tiling.

The owner intends to cruise down the coast next year and go through the Panama Canal, and then up the Pacific Coast to San Francisco. For this reason the topsail schooner was adopted, which makes probably the most efficient seagoing rig for medium-sized auxiliaries where long runs with favorable trade winds are liable to be enjoyed.



Sail plan of auxiliary topsail schooner, building for extended off-shore cruising.

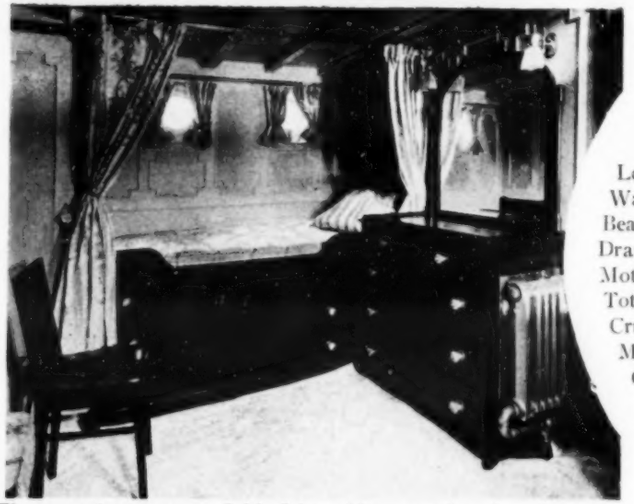


Cabin plan of topsail schooner, showing 37 H. P. Standard motor.

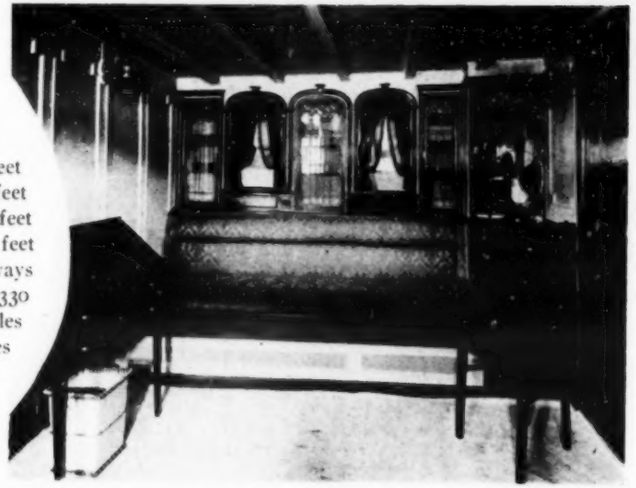
NATOMA.

A 119 Foot Steel Motor Yacht. Eastern Built for Western Use.

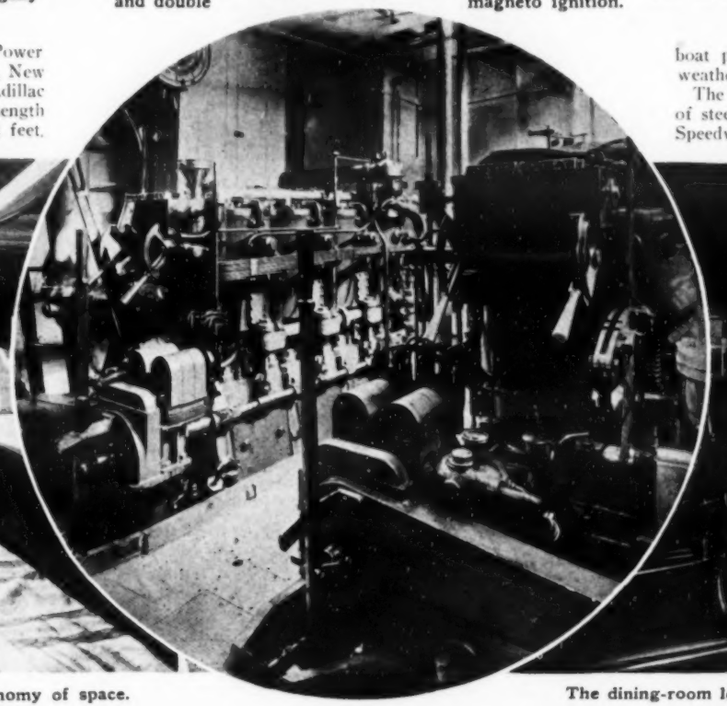
Length Overall	119 feet
Water Line Length	112 feet
Beam	17 feet
Draft	5 feet
Motors	Two 8½ x 10 Speedways
Total Horsepower	330
Cruising Speed	14 miles
Maximum Speed	16 miles
Owner	Mr. Charles H. Foster
Builders	Gas Engine & Power Co., and Chas. L. Seabury & Co., Consl.



The owner's stateroom, finished in white enamel and mahogany which is offset by cut glass knobs.

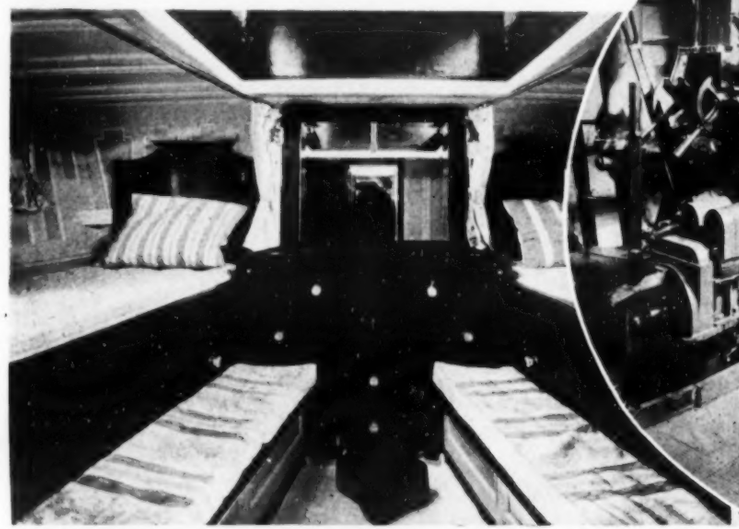


The artistic bookcases in the owner's study prove inviting in bad weather.



The reversing engines of Natoma showing control levers and double magneto ignition.

NATOMA, designed and built by the Gas Engine and Power Company, and Chas. F. Seabury & Co., of Morris Heights, New York City, for Mr. Chas. H. Foster, President of the Cadillac Motor Car Co., of Chicago, Ill., has the following dimensions: Length overall, 119 feet; waterline, 112 feet; beam, 17 feet, and draft, 5 feet.



One of the double staterooms combining comfort with economy of space.

The dining-room looking aft showing buffet with leaden windows.

boat perfectly dry through extended periods of foggy or damp weather during the summer months.

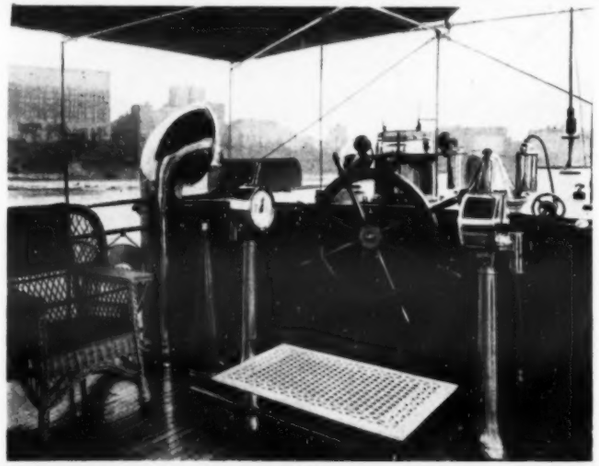
The engine-room is situated between two watertight bulkheads of steel. The main power plant consists of two 165 h.p. 8½ by 10 Speedway motors, which give a sustained cruising speed of 14 miles

The hull is steel throughout and of unusually strong construction,

ranged for a boat of Natoma's size, and offers unsurpassed accommo-

per hour, and a maximum speed of 15 to 16 miles per hour. The auxiliary machinery consists of a General Electric Company motor

The hull is steel throughout and of unusually strong construction, and in some respects the construction is very similar to that of the large steam yachts built by this firm for prominent yachtsmen for off-



Natoma's bridge offers the helmsman every convenience for handling his ship.

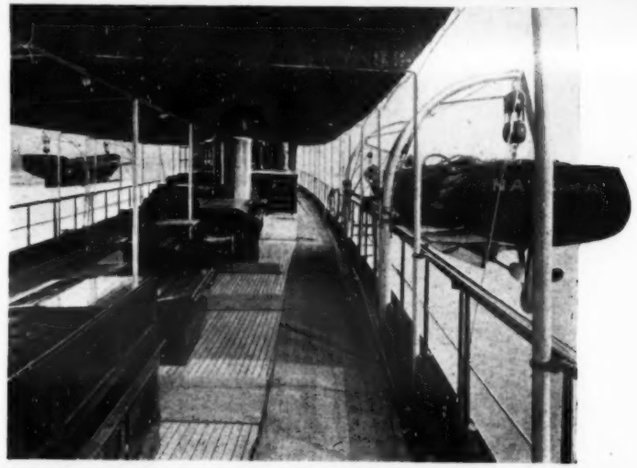
shore cruising. The hull is fitted with long bilge keels to prevent excessive rolling, and they have proven a success in every way. The framework and diagonal braces are exceptionally strong and the boat is built throughout to withstand the severe lake storms and heavy wrenching of coastwise running. The space below decks is unusually well arranged for a boat of Natoma's size, and offers unsurpassed accommodations for a large party.

Aft there are two double and three single staterooms besides a spacious lobby, which could be used as a stateroom, as it is fitted with wide transoms. Just aft of the main companionway there is a center saloon which is neatly appointed and designed to prove a comfortable retreat in damp or stormy weather. This after cabin, similar to the staterooms, is finished in white enamel, all the trimmings being of natural mahogany, which forms a very pleasing contrast. This cabin is fitted with stationary divans and large easy chairs; at one end there is a desk. Ample book cases are provided for the extensive library carried. The staterooms are very well appointed and all have individual wash basins and have private access to the bathroom.

Particular pains have been taken to have the rooms below deck well ventilated, and the ample ports and skylights not only admit an abundance of fresh air, but plenty of light as well. The staterooms are heavily carpeted and the windows have curtains to match. Privacy can be had in the double staterooms by drawing a curtain across the side of the berth, which travels on a brass rod. Mirrors are fitted to the dressers and chest of drawers, and these, in conjunction with the large pier glass on the backs of the doors, the staterooms appear even more spacious than they actually are.

All staterooms have an abundance of locker space and plenty of long drawers for keeping clothes flat. The bathroom is unusually large and complete and is fitted with closets, wash basin and bath tub, each having hot and cold water, and a radiator. The entire boat is heated by hot water, the heating plant being situated forward. This artificial heating arrangement will make the Natoma especially comfortable for long cruises, hunting or fishing trips in the late fall or winter, and will also keep the

per hour, and a maximum speed of 15 to 16 miles per hour. The auxiliary machinery consists of a General Electric Company motor and generator, which lights the boat direct, or furnishes current for



Looking forward showing spacious deck room and removable awning stanchions.

the storage cells. Another small motor is used for pumping purposes and for storing compressed air, which is required to start and reverse the Speedway engines of this size.

The boat is lighted by electricity throughout, which is controlled by a

Natoma, a 119-foot steel motor yacht owned by Mr. Chas. H. Foster of Chicago.

large switchboard having suitable devices. The engine room is very complete; on one side there is a large tank for cylinder oil, which is fitted with a sight glass so that the oil level is always known. A suitable tool locker and work bench are well arranged for the convenience of the operator. The problems of ventilation of the engine room have been carried out very well, and in consequence there is no smoke and little heat in this department while under way, most of it going up through the stack and any remaining gas being ejected through the ventilators or ports.

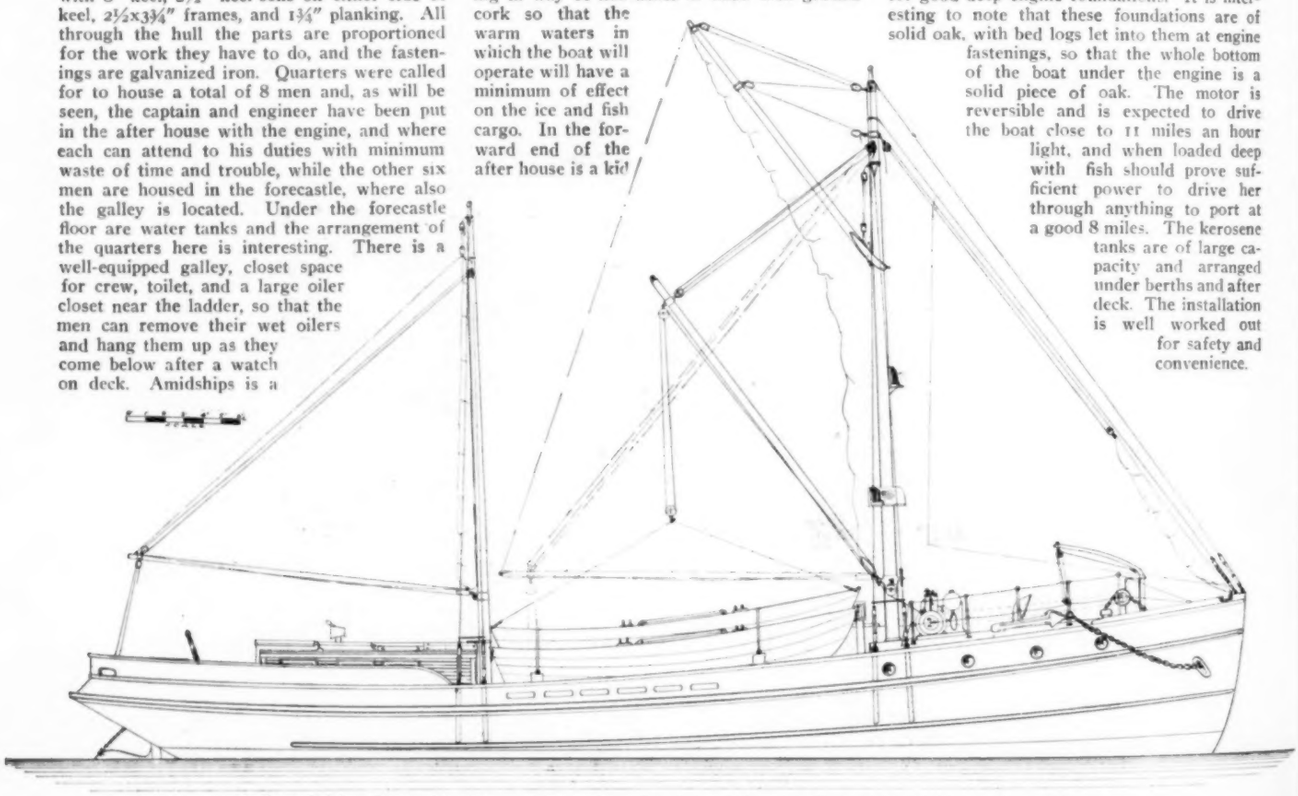
The crew's quarters in the forecastle are very roomy and wide pipe berths afford good accommodation for the sailors, while the captain's stateroom is aft the forecastle on the starboard side, and the engineer's room opposite on the port side. Aft of these rooms and under the after end of the forward deckhouse is the galley which is fitted with large coal stove, also alcohol stove and a big icebox, besides numerous dish lockers, etc., etc. The main saloon in the forward deck house is entirely finished in solid mahogany. The furniture is upholstered in black leather and offers a pleasing effect. At the after end of the saloon there is a large built-in buffet with leaden windows, which particularly harmonize with the general effect.

Natoma is roomy on deck, and although the sky-lights and hatchways aft are very ample, still there is much room left for wicker chairs. There are two large anchors carried forward of the regular steamboat type. The awning frame is made of stout piping and the upright pieces are easily taken out to allow the small boats to be swung inboard. The Natoma carries two boats; a large cutter on the port davits and a Speedway launch on starboard side. Binnacle, telegraph, chart and running lights are all electric.

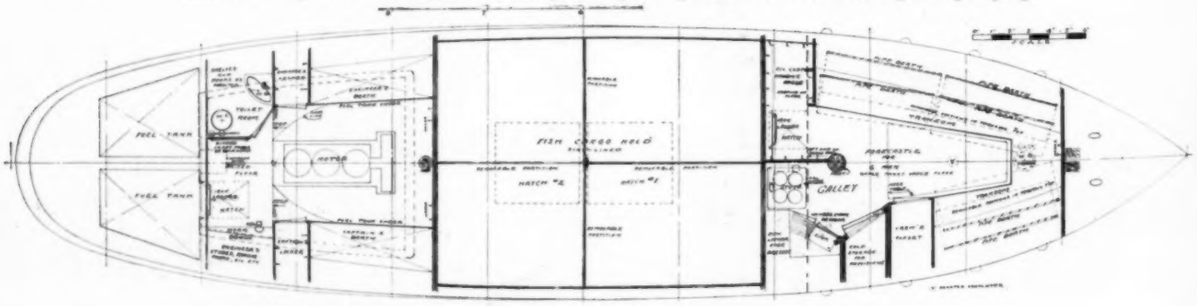
The gasoline and fresh water tanks are very ample and special provision has been made to carry sufficient stores for extended trips.

A Work-Boat for the Gulf.

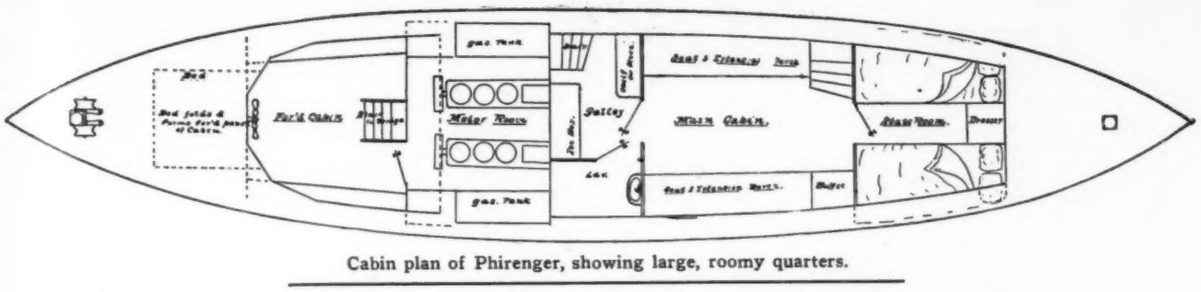
THE plans of a 62′ fishing boat are shown on this page. The boat was designed by William J. Deed, Jr., of Boston, Mass., for Mr. W. B. Ivey, of Jacksonville, Florida, who required a boat for hard service in rough water and her dimensions are: 62′ length over all, length rabbet on stem to aft side of rudder post at deck 56′ 9″, breadth to outside of planking 14′ 4″, depth of hold 5′ 7″, and she draws at half load 5′ 0″. Her lines provide stability at all degrees of load and are easy driving. In construction she is exceptionally strong with 8″ keel, 2¼″ keel-sons on either side of keel, 2½x3¾″ frames, and 1¾″ planking. All through the hull the parts are proportioned for the work they have to do, and the fastenings are galvanized iron. Quarters were called for to house a total of 8 men and, as will be seen, the captain and engineer have been put in the after house with the engine, and where each can attend to his duties with minimum waste of time and trouble, while the other six men are housed in the forecastle, where also the galley is located. Under the forecastle floor are water tanks and the arrangement of the quarters here is interesting. There is a well-equipped galley, closet space for crew, toilet, and a large oiler closet near the ladder, so that the men can remove their wet oilers and hang them up as they come below after a watch on deck. Amidships is a cargo hold for carrying a large catch in ice storage. This hold is divided up into four sections so that the cargo cannot shift in a seaway, and the hatches are large enough to permit quick unloading of fish, yet small enough to allow deck space enough. The fish holds are sheathed with zinc and can be washed out and kept perfectly clean. There is a well provided to drain them and a deck pump of regular Gloucesterman size is placed on deck to pump out fish holds as well as the entire bilge. The space between planking and ceiling in way of fish holds is filled with ground cork so that the warm waters in which the boat will operate will have a minimum of effect on the ice and fish cargo. In the forward end of the after house is a kid for the stowage of fish forks, buckets, bait, etc., and under this kid there is 6′ 1½″ clear head room, while in the balance of the quarters here there is 7′ 8″ head room, except over the platform aft of motor where there is 6′ 3½″. It will be seen by this that there is plenty of air and room in the engine room, so that it will be a livable place, especially as overhead is a syphon ventilator, and there are plenty of good-sized windows. Around the 75 h.p. Kahlenburg motor there is room to walk on all sides, and below the flooring there is plenty of depth for good deep engine foundations. It is interesting to note that these foundations are of solid oak, with bed logs let into them at engine fastenings, so that the whole bottom of the boat under the engine is a solid piece of oak. The motor is reversible and is expected to drive the boat close to 11 miles an hour light, and when loaded deep with fish should prove sufficient power to drive her through anything to port at a good 8 miles. The kerosene tanks are of large capacity and arranged under berths and after deck. The installation is well worked out for safety and convenience.



62-foot fishing boat showing auxiliary rig, also gas engine on deck for hoisting and pumping.



View showing engine room, fish cargo hold and large crew's quarters forward.



Cabin plan of Phirenger, showing large, roomy quarters.

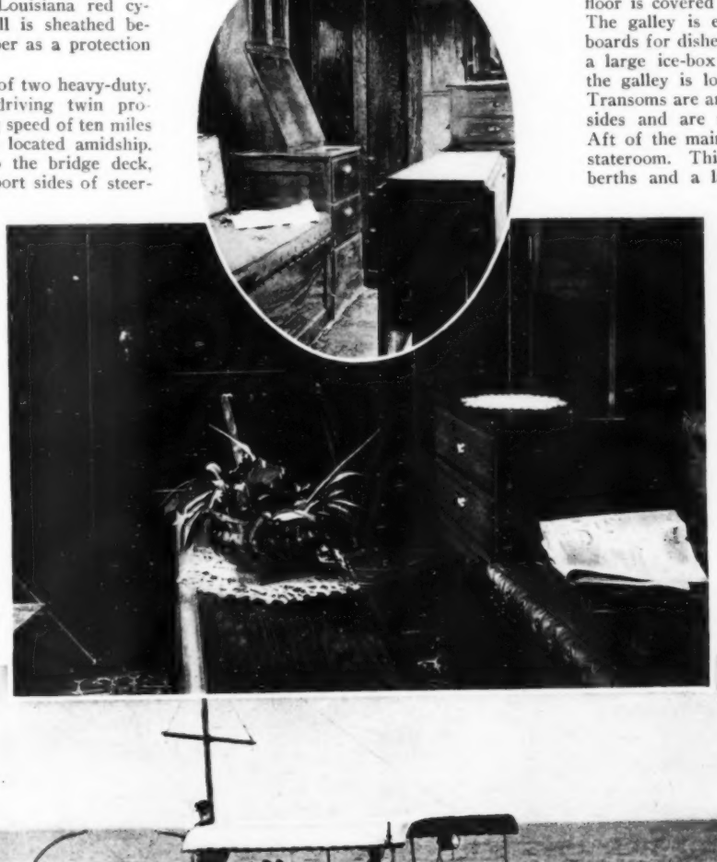
A 55-Foot Southern Cruiser.

PHIRENGER, designed and built by the Defoe Boat and Motor Works, of Bay City, Mich., for T. A. Brouwer, of Westhampton, Long Island, N. Y., is a heavily-constructed cruiser, 55 feet overall, with a beam of 11 feet, and draws a little less than 3 feet of water. Being designed for making the trip from the owner's home on Long Island to his winter residence in Florida, the frame is solidly and strongly constructed of white oak throughout, with 1¼-inch Louisiana red cypress planking, and the hull is sheathed below the waterline with copper as a protection against Southern waters.

The power plant consists of two heavy-duty, four-cycle Stork motors, driving twin propellers, and giving a cruising speed of ten miles per hour. The motors are located amidship. All controls are carried to the bridge deck, and run on starboard and port sides of steering column, respectively, so that each motor is controlled separately by the pilot. The bridge deck being dropped over the motor-room, gives the engine-room slightly less than full headroom, but the headroom throughout the remainder of the boat runs from 6 feet, 1 inch, to 6 feet, 3 inches. The engine-room is finished in white enamel, and its floor is covered with blue-and-white linoleum. A portion of the fuel is carried in the engine-room in heavy galvanized iron tanks placed in drip pans to drain overboard. Another storage tank of 200 gallons capacity is placed under the after deck.

The starboard motor drives a 12-volt dynamo, which, in turn, charges storage batteries to provide for a full system of electric lights. A fresh water tank of large capacity, well forward in the boat, is connected to feed, by gravity, to galley and lavatories. The bridge deck has a comfortable seat located against cabin trunk and plenty of space for wicker chairs, and the deck is surrounded by an enameled pipe rail and covered by a canvas canopy with detachable side-curtains for use in stormy weather. A companionway leads aft of the bridge deck on the starboard side to the galley, which is finished in white enamel. The floor is covered with blue-and-white linoleum. The galley is equipped with racks and cupboards for dishes, a three-burner alcohol stove, a large ice-box and a copper tank. Aft of the galley is located the main dining-saloon. Transoms are arranged the full length on both sides and are upholstered in Chase leather. Aft of the main cabin is located the owner's stateroom. This is provided with two double berths and a large dresser with plate-glass mirror above. Both forward and aft cabins and aft stateroom are paneled in oak, finished in Old English.

The floors are covered with dark green Wilton rugs, with heavy silk curtains at the windows to match. All exterior work of the cabin is of heavy oak finished in a dark shade. Decks are of white pine, laid in narrow strips, calked and payed with marine glue. The windows are of the drop-sash type fitted with bronze screens, and ventilate the interior in a way that insures cool quarters below in the summer time. A dinghy is stowed on the aft deck under its davits.

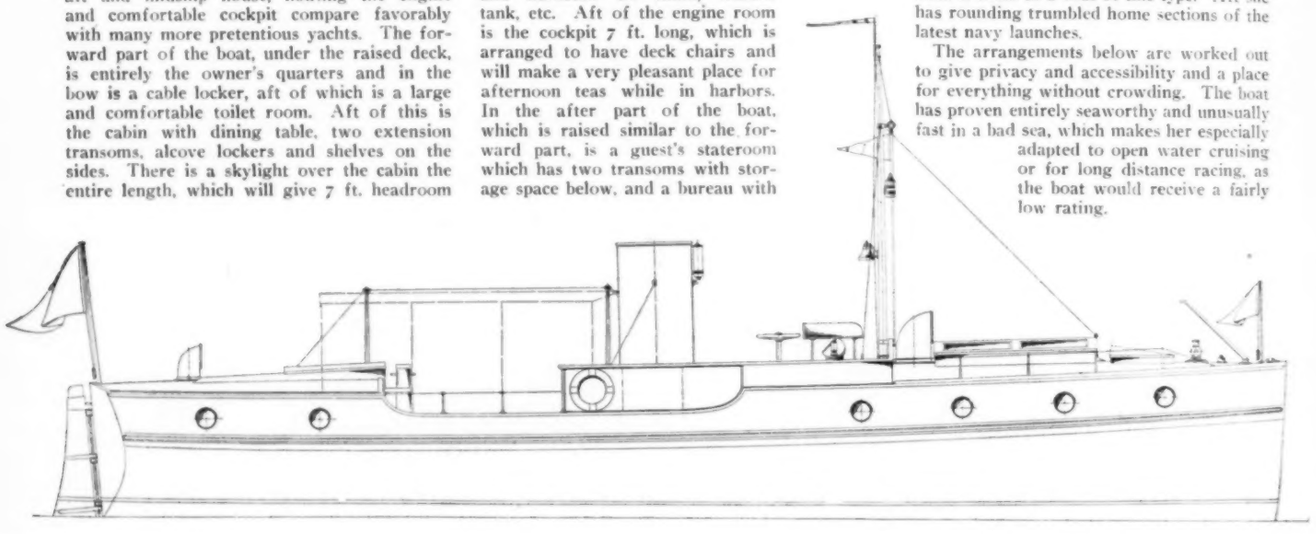


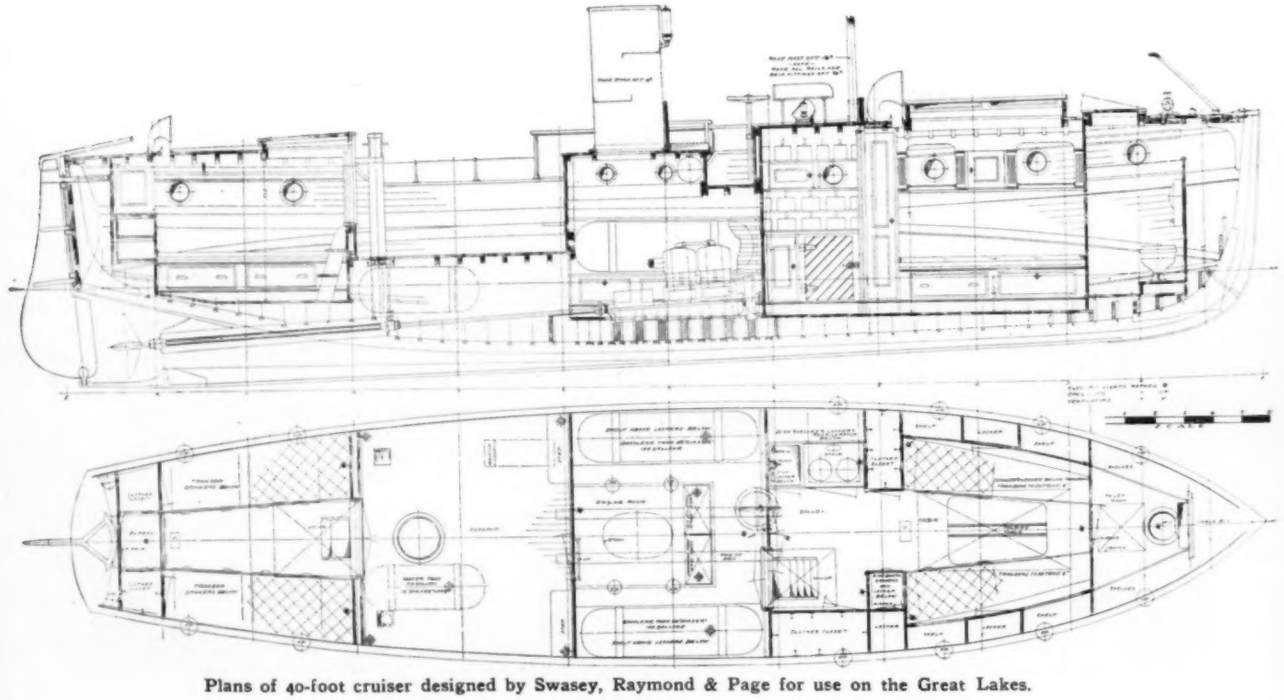
Phirenger at full speed and two views of her cabins.

A Buoyant Fresh Water Cruiser.

THE accompanying plans are of a 40 ft. power cruiser designed by Swasey, Raymond & Page, Inc., for Mr. W. T. Warren, of Chicago, Ill., to be used for cruising on the Great Lakes. Her dimensions are: length overall, 40 ft.; length waterline, 39 ft. 2½ ins.; beam, 8 ft. 11 ins.; draft, 3 ft. 4 ins. She is of the double cabin type or raised deck boat and her lines show by their flare forward, good depth, dead rise and buoyancy, with plenty of freeboard, raised deck aft, and plumb stern and stem that she was designed to have excellent seagoing qualities and speed. This boat, in many essentials, is a notable production, embodying figures of design, power installation and arrangement of living quarters, that should make the vessel very able and splendidly adapted for cruising requirements. Strength and reliability have been carefully worked out to the requirements of a fair turn of speed. The deck arrangement is good. The raised deck forward and aft and midship house, housing the engine and comfortable cockpit compare favorably with many more pretentious yachts. The forward part of the boat, under the raised deck, is entirely the owner's quarters and in the bow is a cable locker, aft of which is a large and comfortable toilet room. Aft of this is the cabin with dining table, two extension transoms, alcove lockers and shelves on the sides. There is a skylight over the cabin the entire length, which will give 7 ft. headroom over the floor space and over 6 ft. headroom under the beams. On the port side aft is a large clothes closet and on the starboard side a sideboard. Aft of this is the galley and vestibule, very well fitted for cruising and also gives a place to change wet clothes in without getting the cabin damp. In this vestibule, stairs lead to the bridge. The bridge is 6 ft. 6 ins. in length, which will give an abundance of room, and under the bridge is the engine room, which will contain a 30 h.p. 5½ x 8 4-cylinder Sterling. The entire power plant is in this compartment. There is a trunk over the bridge which will give headroom of 5 ft. 3 ins. in the engine room and excellent ventilation. This trunk will have a bridge seat on the forward end and also a ventilation stack. There are two 100-gallon gasoline tanks of Janney Steinmetz manufacture in the wing on either side of the engine room. The engine room will also contain bilge pumps, electric lighting outfit, cylinder and kerosene oil tanks, whistle tank, etc. Aft of the engine room is the cockpit 7 ft. long, which is arranged to have deck chairs and will make a very pleasant place for afternoon teas while in harbors. In the after part of the boat, which is raised similar to the forward part, is a guest's stateroom which has two transoms with storage space below, and a bureau with three drawers and two clothes lockers on the sides, mirror, etc. In the very stern of the boat is a small lazarette. The effect of the high freeboard is lowered by a black hull with the guard and sheer strake painted white, thus reducing the apparent freeboard to about the normal amount. Aft around the bridge is a mahogany spray board, and on the sides a high rail protected by a khaki weather cloth. The boat has a well proportioned stack and carries a signal mast, and has Patterson trap ventilators for ventilation. The construction is quite heavy and oak is used extensively for the keel and framing, the frames being 1⅝ in. x 1½ in., spaced 9 in. on centers and 4½ in. in the engine room. The planking is of yellow pine, and the superstructure of skylights, etc., are of mahogany. The boat is fitted with bilge keels to minimize rolling and her form is essentially buoyant. In the transverse sections she shows a straight dead rise the entire length, and more dead rise than is usual in a boat of this type. Aft she has rounding trumbled home sections of the latest navy launches.

The arrangements below are worked out to give privacy and accessibility and a place for everything without crowding. The boat has proven entirely seaworthy and unusually fast in a bad sea, which makes her especially adapted to open water cruising or for long distance racing, as the boat would receive a fairly low rating.





Plans of 40-foot cruiser designed by Swasey, Raymond & Page for use on the Great Lakes.

A Speedy Herreshoff Model.

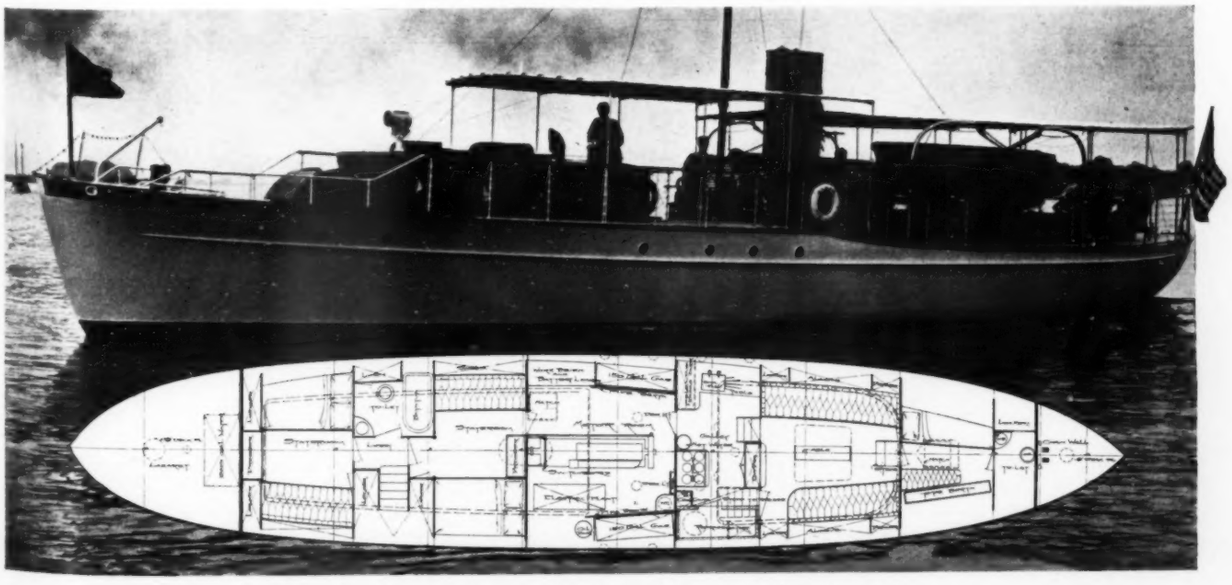
The 40-footer Fad, an express runabout.

THE Herreshoff Mfg. Co., of Bristol, R. I., recently turned out an excellent type of launch from the boards of Nathaniel G Herreshoff. The boat, which is of the runabout type, has proved exceptionally fast, averaging 25 miles per hour during her trials in Bristol Harbor. This boat is 40 feet over all and has a very slender and clean bow. In the lines of the bow are incorporated the reversed curves so peculiar to the Herreshoff type. Her beam is seven feet, sufficient to admit of plenty of room aboard, notwithstanding the degree of speed she is capable of developing. The small deck forward is fitted with suitable cleats and chocks. The coaming is carried well aft and nicely tapered. There are two cockpits, one situated amidships where the helmsman's station is arranged; this forward cockpit has sufficient room to comfortably accommodate ten to twelve persons. Aft of the forward cockpit is the small cabin house, a daintily arranged projection, with rounded roof, with a hand rail at the center part running forward and aft. The house is well lighted with three windows on each side and glass bulkhead doors on the forward and afterwards ends. There is seating capacity for six people in the cabin, also a lounging place with transoms. Aft of the house is the second cockpit, and although of smaller dimensions than the forward one, still there is ample accommodation to comfortably seat six to eight persons and it proves very attractive when the boat is running at full speed. Good free board is carried well aft and the stern being very full, the boat shows no tendency to settle when running at her maximum speed, yet at the same time her lines are so nicely carried out that there is no apparent drag whatever. The power plant consists of an 8-cylinder Sterling motor of 150 rated horsepower. A special type of engine bed has been introduced and other details have reduced vibration to a minimum. The boat was designed to prove exceptionally fast, yet at the same time to combine comfort and seagoing qualities, as the boat will be used on the open waters of Massachusetts Bay. The same refinement of finish that is characteristic of the Herreshoff product has been carried out on this model.

Nymph, a Real Cruiser.

THE Nymph, owned by Mr. John R. Brownell, of Dayton, Ohio, was recently turned out by the Matthews Boat Company, of Port Clinton, Ohio, and is an excellent model of a very popular type. The general dimensions of the boat are length over all, 75 feet; beam, 14 feet; draft, 4 feet 6 inches. The arrangements below are very complete. There is a stateroom under forward deck having toilet adjoining; this stateroom may be entered from the deck through a scuttle hatch, or door opening into main cabin or dining-room. The dining-room is fitted with permanent seats on the sides, which form transom berths, if additional sleeping quarters are desired. This cabin is finished in highly figured African mahogany, with built in sideboard, alcoves, lockers, etc. Ample ports and windows give good light and insure thorough ventilation. A companionway on starboard side leads to bridge deck, while the door on the port side of the buffet opens into the galley which extends the full width of the boat, and is arranged with a large ice box filling from deck; 6-hole coal stove; 2-hole alcohol stove; hot and cold water connections at sink; dish racks and other galley conveniences are provided for. The motor room is placed aft of the galley and is practically amidship. The gasoline supply is located on the sides of the engine room in heavy copper tanks, with a capacity of about 350 gallons. The motive power consists of the new 1914 type 6½ x 9 Sterling engine, fitted with air starting device, Irish air control, which is so arranged that the motor may be controlled from the bridge or in the engine room. An independent I. K. W. Fay & Bowen electric lighting plant is installed on the starboard side. A small door in the after steel bulkhead in the engine room opens into the owner's cabin, and allows an emergency passage through the engine room, so that one can go from one end of the boat to the other under deck. Aft of the engine room the boat is divided into two double staterooms, extending the full width of the boat, with a large bathroom between and companionway with entrance to deck on starboard side. The boat carries two tenders, one a 13-foot power tender equipped with a Fulton single cylinder motor, and a 10-foot lightweight rowing tender.

The stack is arranged to ventilate the motor room and the owner's stateroom, and also receives the stove-pipe from the galley. On the builder's trial trip, the boat made slightly better than 12 miles per hour.



The Nymph, a 75-footer owned by John R. Brownell, of Dayton, Ohio.

THE PRIZE CONTEST — IN QVESTIONS AND ANSWERS

Questions for the November Contest.

1. What has your experience during the past season with marine motors taught you, especially as regards the different fuels, fuel economy and the improvement in design, which should be given attention?

Suggested by A. F. D., Washington, D. C.

2. Describe with drawings the construction of a cabin wall-rack for holding books, glasses, or the like.

Suggested by Alfred O. Elden, Portland, Me.

3. Discuss cabin interiors in regard to best methods of finishing, i. e., kinds of wood, painted or varnished combinations, upholstering, etc.

Suggested by F. H. Maloney, Bridgeport, Conn.

Rules for the Contest.

Answers to these questions, addressed to the Editor of MoToR BoatinG, 119 W. 40th St., New York, must be: (*a*) In our hands on or before September 25. (*b*) about 500 words long. (*c*) written on one side of the paper only, (*d*) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired.) Questions for the next contest should reach us on or before the 25th of September.

The prizes are: For each of the best *answers* to the questions above, *any article* advertised in MoToR BoatinG, of which the advertised price does not exceed $25, or a credit of $25 on *any article advertised* in MoToR BoatinG, which sells for more than that amount.

(*There are three prizes, one for each question, and a contestant need send in an answer to but one if he does not care to answer all.*)

For each of the questions selected for use in the next contest, *any article* advertised in MoToR BoatinG, of which the advertised price does not exceed $5, or a credit of $5 on *any artice advertised* in MoToR BoatinG, which sells for more than that amount.

For non-prize-winning answers published we will pay space rates.

Making a Self-Bailing Cockpit.

A Great Variety of Ways in Which This Part of the Boat May Be Kept Dry Automatically. Raised Floors, Scuppers, Double Planking with Canvas Between and Other Alternatives.

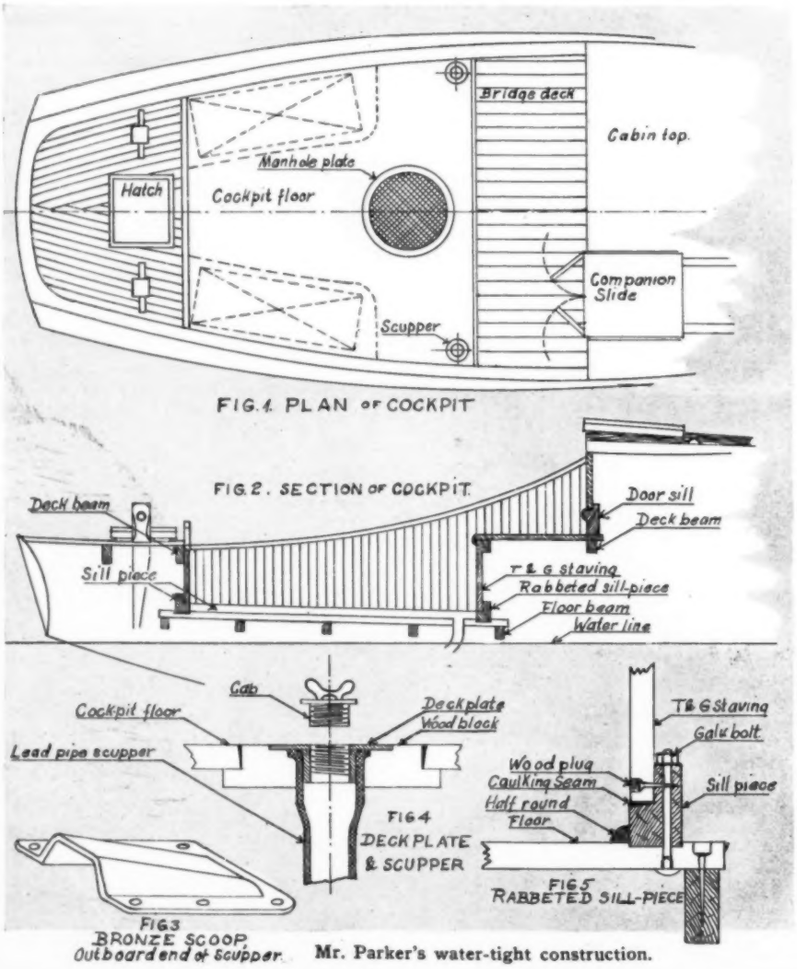
Really Self-Bailing.

The Prize-Winning Answer.

TO BE absolutely watertight, the cockpit of a small cruiser should be so designed and built that it could be filled up with water and none leak into the hull or cabin. For a regular sea-going cruiser, the cockpit should, of course, be very small and high above the water-line. In an ordinary small cruiser, however, the cockpit is intended to drain off rain, spray, and an occasional heavy sea, but it is a great advantage to have it watertight throughout. The drawings shown are not to scale and do not show many constructional details, but are intended to give a general idea of the design.

Heavy floor beams should be used and, if possible, supported in the middle to prevent the floor from working and sagging when walked and jumped upon. Then the floor should be made of ¾-inch or 1-inch stuff with caulking seams. It could also be of tongue and grooved lumber with cotton and paint between the laps. I have a cockpit floor made of ¾-inch by 3-inch boards with square planed edges which has never been painted or caulked and does not leak. For a first class job a double flooring could be laid with canvas between and its edges turned up under the staving.

After the floor is laid the rabbeted sill pieces (Fig. 5) should be laid around the edge of the cockpit. These are to take the ends of the T & G cockpit staving. It is best to cut a groove or rabbet in the cockpit floor to take these sill pieces and then lay them in white lead and screw or bolt down strongly. A fairly good job can be done by bolting these sill pieces down on strips of canton flannel laid in white lead and using no rabbet in the floor. It pays to do a first-class job here, though. The corners of these sill pieces should make a tight joint, and it is well to drive a wooden plug (stopwater) in the seam at each corner. It should have been mentioned that the floor, if caulked, should have been caulked before the sill pieces were laid. The cockpit is now staved up all around with T & G material, using cotton and white lead in the



Mr. Parker's water-tight construction.

grooves and leaving a caulking seam at the bottom where the staving lets into the sill piece. The staving is best fastened by screws which should be bored for and wooden plugs afterward driven in and smoothed off. Particular care should be used in fitting the corners of the cockpit staving. Reinforcing corner pieces should be used and a caulking seam made if possible.

In the plans a bridge deck is shown; if this is not used the cabin door should be high anyway with a flight of steps leading up to it, if necessary. As this construction leaves no openings whatever in the cockpit, access to the after deck is obtained by a hatch in the deck, as shown (Figs. 1 and 2). This should be large enough to admit a man and the cover should be watertight when buttoned down. (Previous numbers of MoToR BoatinG have told how to make a watertight hatch.)

The cockpit floor should have a little crown and be sloped forward or aft as the builder thinks best and should be at least five inches above the water line at its lowest point. Scuppers are placed in the two lower corners and sometimes in all four corners. They should be large, about two inches in diameter. A thick wooden block is let through the floor where the scuppers are to come and two ordinary brass deck plates with screw caps set into these blocks flush (Fig. 4). A lead pipe with its end expanded is soldered into these deck plates, as shown, or else a hole is bored in the block to make a tight fit for the pipe and the deck plate collar driven tightly into the end of the pipe. This makes a neat finish to the scupper and the opening can be easily closed by the screw plug. The scupper pipe is then bent around to lead outboard either above or below water and the end should be flanged over into a groove cut in the outside of the planking around the hole. Plenty of white or red lead should be used here and the flange fastened by thin brass screws in preference to copper tacks.

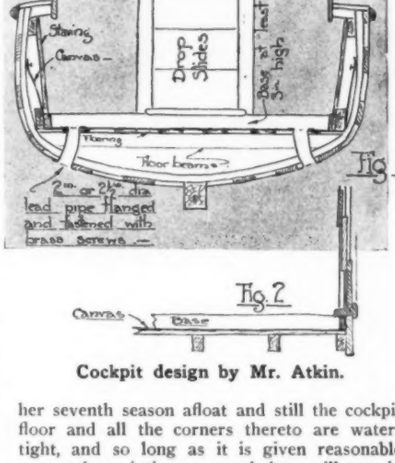
An important detail is the bronze scoop shown in Fig. 3. A pattern is easily made of thin wood and two castings should be made of brass or bronze. A scoop should be screwed over each outboard scupper opening, open end facing aft. These will be of great service in keeping water from spouting back through the scuppers when under way. It will be found that no water can come back no matter how much the boat rolls. If the scoops are under water, a little may be forced back when backing at full speed but in actual practice this has been found to cause little trouble.

In fact, any possible forcing back of this nature will be so slight that it may be looked upon as negligible from a practical standpoint. In other words, these scoops will be quite reliable.

H. H. PARKER,
Oakland, Cal.

A Watertight, Self-Draining Cockpit.

THE accompanying sketches show the construction and general arrangement of an absolutely watertight cockpit. The boat, a part of which this cockpit is, this year enters her seventh season afloat and still the cockpit floor and all the corners thereto are watertight, and so long as it is given reasonable care and a painting now and then, will remain so until the boat dies of old age.



Cockpit design by Mr. Atkin.

Fig. 1 is a cross-section through the cockpit of the boat mentioned. The floor beams are of 2-in. by 3-in. oak, some 10 in. apart, and the flooring ⅞-in. tongue and grooved yellow pine, 2½ in. wide, fastened with galvanized iron boat nails. The heads are countersunk and the floor planed nicely and given two coats of lead paint. Medium-weight canvas, if possible in one piece, is stretched over the flooring, both forward and aft, and fastened in place with ¾-in. copper tacks. The canvas is left long at all sides and turned up against the sides of the boat for at least eight inches. The forward and after end pull under the bulkheads and up the inner sides, and are covered by the joiner work. Of course, the canvas is laid before either bulkhead is in place. A baseboard, ⅞" x 3", fastened against a cleat, 1⅛" x 4", along the sides, as in Fig. 1 and Fig. 2, holding the canvas securely in place and forming nailing pieces for the staving, which extends upward to the underside of deck.

Lead pipe, 2 in. or 2½ in. in diameter, makes the best drains, as the lead is very easy to flange against the planking and around the holes in the floor. Also, it will not crack, and stands the corrosive action of salt water well. A drain in each of the after corners is sufficient, but one in each corner, of course, will drain off more water and faster, too. Where the lead is flanged against the planking, and at the inboard end, too, use flat head brass screws for fastenings, and drive in about ⅝ in. apart, with plenty of white lead in the joints.

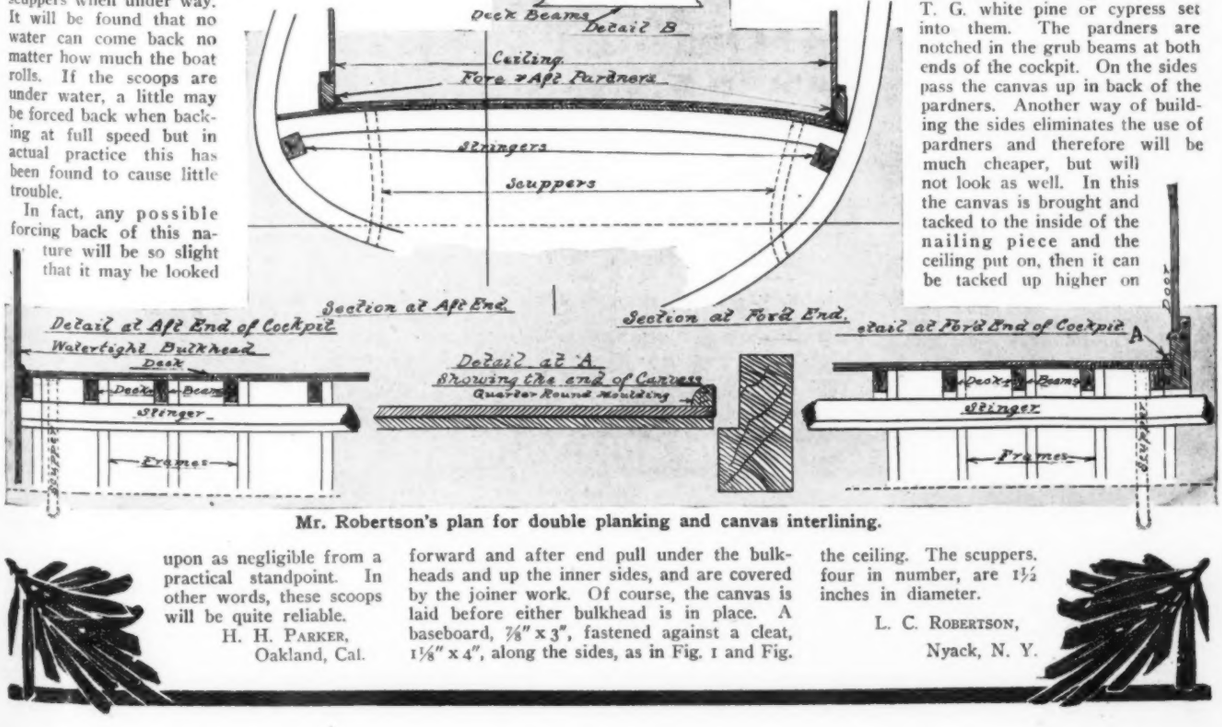
Paint the canvas thoroughly, at least 3 coats of oil paint, especially under the baseboards and in the corners, allowing each coat to dry hard before the next is applied.

By using slides in place of the usual companion doors, the cockpit will be practically watertight to a depth of 8 to 10 inches.

WILLIAM ATKIN, Huntington, L. I.

Double Planking with Canvas.

IT is a comparatively simple matter to make a watertight cockpit. This can readily be seen with the accompanying details. The deck beams are 2 inches by 3 inches yellow pine. They are notched in the stringers or clamps alongside of each frame and have a camber of ½ inch to the foot. The flooring or deck is two layers of ½ inch white pine or cypress with canvas, thickly coated with paint, laid between. Around the cockpit are quarter round mouldings of 1 inch white oak. At the forward end of the cockpit the canvas should be brought up in back of this moulding. At the after end of the cockpit is generally a watertight bulkhead of two layers of ½-inch white pine or cypress. The canvas may be brought up in back of the moulding as at the forward end or else it can be passed in and up between the bulkhead. At the forward end is the grub beam, the flooring is to be laid in as shown. Along the sides run the fore and aft pardners of white oak with the ceiling of ½ inch T. G. white pine or cypress set into them. The pardners are notched in the grub beams at both ends of the cockpit. On the sides pass the canvas up in back of the pardners. Another way of building the sides eliminates the use of pardners and therefore will be much cheaper, but will not look as well. In this the canvas is brought and tacked to the inside of the nailing piece and the ceiling put on, then it can be tacked up higher on the ceiling. The scuppers, four in number, are 1½ inches in diameter.



Mr. Robertson's plan for double planking and canvas interlining.

L. C. ROBERTSON,
Nyack, N. Y.

A Cockpit for a 30 Footer.

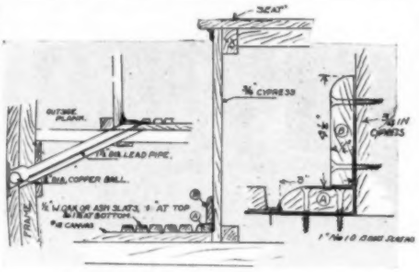
A SLIGHT crown of about ¼ inch to the foot to be given to the cockpit beams — the deck or floor to be ⅞ inch tongued and grooved cypress. Sheathing under the seats to be ¾ inch cypress about 10 inches wide, with grain running fore and aft, and athwartship at ends. To give the required heights, under the seat, a strip about 3¾ inch or 4 inches is to be worked first above the floor, the entire floor to be covered with No. 12 canvas, turned up 4 inches all around. Within an inch of the upper edge a strip 7 inches wide is to be sewed to hang down.

After the flooring has been coated with thick white, or lead colored paint, the canvas should be stretched from center outwards and held by copper tacks on top of canvas and pressed out against the turned-up-corner and side of cockpit. A cleat (A), with sharp edge taken off, so as not to cut the corners, is to be screwed down to floor.

A base board (B) is to be secured against the turned up canvas and 7 inch strip, and into the side, by brass screws 1½ inch No. 10.

The strip passing under lower edge of B and over the top of A, is to be secured to the floor, with 15-oz. copper tacks through an inch strip of 7-lb. lead.

To protect the canvas and afford sure footing when boat is rolling, strips of W. oak or ash, set in thick white or lead colored lead



Mr. Cassidy's self-bailing cock-pit.

paint, are to be secured to the floor with 1 inch No. 10 brass screws.

These cleats are to be 1¼ inches wide at bottom and 1 inch at top, and spaced 1½ inches between centers. They should terminate about 1 inch short of forward and after ends, from the cleat A.

The floor should have a slight pitch aft, when vessel is in ordinary trim to allow water to run to the scuppers on each side at the after end.

The cleat A should be cut sufficiently short at after end and outboard ends of the afterpiece, to allow for a 1½ inch lead pipe with an inch flange. The lead pipe to be supported in a wood trough secured to cockpit floor and the outside plank.

The outer end is to be bulged out to 2½ inches in diameter and for a depth of 3 inches, so as to contain a 2 inch copper ball, which will rise and close scupper when struck by a wave, and drop back again against a brass grating secured through the lead flange and outside plank, flush with planking.

The base C and moulding under the top of seat can be connected by a vertical strip dividing the space at front of seats into panels.

Arthur B. Cassidy.

Power Output Per Cylinder.

The Causes of Unequal Power Production by the Various Units of a Multi-Cylinder Motor. How to Go About Locating the Source of Trouble in Any Case and How to Remedy It.

THE PRIZE CONTEST—Answers to the Second Question in the July Issue.

LET us take up first the variations due to construction.

1st. Heights of ports and location of same with respect to the travel of the piston.

This is a fault which it is impossible to avoid without the most careful machining of both ports and pistons, a practice which is altogether too expensive for the cheaper types of engines now on the market. A few manufacturers are, however, at the present time, machining their cylinders as above and there is no doubt but that the practice makes for a much more consistent engine. It has been the writer's experience that the variation in the width and position of the ports due to the shifting or washing away of the cores when casting the cylinders will affect the power developed as much as 10 or 12 per cent. per cylinder.

2nd. Variation in the length of the piston with respect to the piston pin.

The length of the piston below the center line of the pin is usually held uniform by finishing the base of the piston, but the distance from the center line of the pin to the top of the piston is subject to variation as the top edge of the piston is seldom machined because of the projection of the baffle at this point. This of course allows a possible variation in the effective width of the exhaust and bypass ports which will influence the power developed to some extent.

3rd. Variation in the volume of the clearance space.

This is a fault which may occur through carelessness in the foundry when casting the cylinders or may be due to improper machining. The height of the clearance space is an important factor to consider when machining the base of the cylinders but is a dimension difficult to maintain unless the whole dome of the cylinder head is machined, a practice which is again too expensive for common practice, and is indulged in by but very few manufacturers.

4th. Variation in the size of the bypass passage.

This variation is due in a great many cases to obstructions being left in the passage when the casting is made and not being removed when the engine is assembled. It may also be due to a difference in the flame arresting device sometimes placed in this passage.

Systematic Consideration.

5th. Variation in the volume of the crank case.

This is important as affecting the crank case compression which in turn affects the amount of fuel taken into the cylinder at each stroke. This variation may occur from inaccuracies in the crank case casting, variations in machining, or unavoidable differences in the shape of the casting, or of the parts on the interior of the case, such as the connecting rod, oiling devices, bosses for drain cocks, etc. These variations are very difficult to control and it is practically impossible to arrive at more than a close approximation to similarity, in the crank case compression for the various cylinders.

6th. Unequal distribution of fuel.

The carbureter may be placed in such a position with respect to the engine that one cylinder may get more than its proper proportion of fuel which will of necessity affect the power developed. Fins or projections on the casting left inside the manifold will also affect the fuel distribution.

All of the above factors enter into the construction of every engine and admit of possible remedy at the factory, the expense, however, in the majority of cases amounting to more than the gain derived, although some of the faults may be eliminated by careful machine work and intelligent assembling, and it is to the credit of the engineering fraternity to note that several manufacturers are considering these avoidable variations and are taking steps to make them as slight as possible.

But however careful the manufacturer may be in the erection of his engine, there are many factors causing variation of power over which he has no control and for which the operator of the engine is strictly responsible.

1st. Unequal carbonizing of the cylinders.

Carbon is a poor thing to allow to accumulate in the cylinders, but granting that it is allowed to accumulate it is seldom that the deposit is the same in all the cylinders, which of course has its effect on the power developed, causing preignition, increased compression, etc. The remedy is to prevent the carbon deposit by the use of the best gas engine lubricating oil to be obtained, fed in the proper proportion, and the use when necessary of some of the many anti-carbon mixtures on the market.

2nd. Variations in the ignition system.

One spark plug may be sooty while the rest are clean or one spark coil may not be operating efficiently. The points of one of the plugs may be improperly adjusted admitting a weak spark, or there may be a loose connection or partial short circuit at some point in the wiring. One of the contact points in the timer may not be operating, or if a magneto is used as a source of current, one of the contact points in the distributor may be poor.

3rd. Variations in heating.

The cylinders may not all cool properly due to an obstruction at some point in the water cooling system, or to a failure in the lubrication system. While a cylinder running too hot may result in a loss of power and consequent danger of serious mishap to the engine, a cylinder running too cool will also result in a loss of power owing to the poor vaporization of the fuel and should be watched carefully. All of the cylinders should be of such a temperature that the operator can just hold his hand on them without discomfort. The cylinders may not cool properly due to some of the moving parts in one of the cylinders being fitted too tight causing them to heat and bind with a resulting loss of power.

4th. Obstructions in the inlet manifold.

This fault may be due to carelessness at the factory or to some foreign substance entering the manifold through the air passage of the carbureter. This obstruction in the manifold is of rare oc-

currence, it more often lodging in the carbureter itself and affecting the power of all the cylinders alike.

This is a prolific source of variation in power and should be watched carefully. The crank shaft bearings may be worn or the lubrication not working properly and the crank case compression may be lost through this bearing. There may be small leaks around the base of the cylinder, between the halves of the crank case, around the priming or drain cocks, around or through the spark plugs, or around any other part which is screwed into the cylinders or crank case. The piston rings may be broken or worn so badly that the charge blows back and forth past the piston resulting in a loss of power. The best way to detect this fault is to watch for smoke issuing from some of the various places mentioned above, and by turning the engine over by hand it can be ascertained whether the piston rings are holding the compression or not.

In the majority of cases cited above the fault suggests the remedy and it is only by a careful study of his engine and his own peculiar conditions that the operator can detect and eliminate his power losses.

As has been mentioned before there are many of these losses which are so small and so difficult of elimination that they should cause no concern to the ordinary manufacturer or operator.

E. D. GLIDDEN, Three Rivers, Mich.

Test Each Cylinder Separately.

WHEN there are indications that unequal power is being developed in the cylinders, cut out the ignition in all but one cylinder, and take readings of the engine speed with a speed indicator. Test each cylinder in turn, and note down the speeds in tabular form so that they can be readily compared. Care must be taken to maintain the same conditions, such as carbureter adjustment, wind, position of weights in the boat, etc., during these readings, so as to give each cylinder a fair and impartial test. Any difference in power developed will make itself known immediately by a lower or higher speed reading than the rest of the cylinders.

There are several possible reasons for a cylinder developing less power than its mates, namely:

1. Late ignition, due to { Stronger tension on vibrator spring on coil; defective or worn timer contacts.
2. Poor compression, due to { Carbonized or leaky valves; sticking piston rings; scored piston or cylinder walls.
3. Exhaust port obstructed with carbon deposits.

Late ignition will be caused most probably by the coil vibrator having stronger tension than that of the other coils.

This is easily adjusted, the proper tension being no more than that necessary to insure regular firing. If caused by a defective or worn timer, the part will have to be repaired or replaced. The wearing away of the timer contacts will often cause the cylinders to fire a trifle out of step, but enough to cause different power development in some cylinders.

It is seldom that the timer contacts are not equally spaced, but should this be the case, repairing (if possible) or replacing will remove the defect.

If caused by poor compression, due to carbonized valves, regrinding will make them tight. For loosening stuck piston rings, a kerosene bath and a scraping will do the trick and restore a good compression. For scored piston and cylinder walls, see the answers in the August, 1912, issue of MoToR BoatinG, regarding the restoration of compression.

Should a carbon deposit in the exhaust port partially obstruct the ready exit of gases, a loss of power may result. Scraping will, of course, remove this. The causes should be investigated in the order given, the last being the least probable.

W. E. Motz, Philadelphia, Pa.

A Process of Elimination.

IF YOU have reason to believe that all of your cylinders are not working in unison try out each one separately by running the engine (with the clutch out) with the others cut out, noting the difference in actual r.p.m. Once the erring cylinder is detected the trouble is usually found by a process of elimination.

Engines set at a considerable angle (say 7 degrees or over), especially those having low piston speed, frequently fail to run smoothly because of the cylinders, due to condensation of fuel in the manifold. The relative carbon deposits on the plugs will decide this, presupposing the lubrication to be correct.

Condensation in the inlet piping may be minimized by running a hot-air tube from a jacket around the bare exhaust pipe to the air inlet of the carbureter, or better still, by heating the inlet manifold from the exhaust. However, with an engine of more than three cylinders, either two or four cycle, the best practice wherever possible is to use a separate carbureter and manifold for each set of two or three cylinders. If this does not solve the problem, next go over your ignition carefully. If it is of the make-and-break type, by "turning her over" slowly by hand you may find that all of the igniters do not snap at the same relative position of the piston, because perhaps they are not set alike, or there has been more wear in some of the parts. Possibly the igniter spring on the offending cylinder is old and sluggish and does not rupture the circuit as quickly as one of better temper; in this case there will be a weak spark and therefore poor combustion of the charge. Poor contacts of the points due to pitting or fouling will result much the same. If there are more than three cylinders make certain that each igniter "breaks" before the next in sequence "makes" contact. For instance if No. 4 is on contact before No. 3 "breaks" there will be a very weak spark in No. 3 because, the current is generally insufficient to supply both at once. The points may be too long (if the timing is

(*Continued on page 48*)

Why Do Boats Squat?

The Causes of Change of Trim and Some Suggestions as to How It May Be Prevented. The Theory that the Phenomenon is a Symptom Rather Than a Cause of Resistance.

THE PRIZE CONTEST—Answers to the Third Question in the July Issue.

FROM the results of model tests in the various model basins in this country and Europe, the following results as regards squatting and change of trim have been obtained. These results are based, not on actual speed in knots, but on a "speed length ratio," *i.e.*, V/L where

V = speed in knots,
L = length in feet,

thus making the results applicable to all lengths and speeds.

At low speeds, say V/L is less than 1, both bow and stern of the vessel settle deeper in the water, short vessels with rather much beam settling more than long, fine vessels.

When V/L —, there is very little change of trim, in most cases the bow going down faster than the stern, if the vessel is full.

Where V/L is greater than 1, the bow settles more slowly, and when V/L—1.15, the bow stops settling. When V/L—1.3 to 1.5, the bow begins to rise, returns to its original level and continues to rise, the stern setting more and more rapidly at about V/L—1.3. As the stern settles more rapidly than the bow rises, the whole ship continues to settle while this rapid change of trim is taking place.

Theoretical Consideration.

At higher speeds, V/L — 1.8 to 1.9, the stern settles more slowly, and beyond a speed length ratio of 2, it does not change its level, but the bow rises with increase of speed, resulting in the whole vessel rising when V/L is greater than 2.

However, the center of gravity of the vessel will never rise to the level it has when at rest, unless driven to extreme speeds, although it may appear to do so, as the passage of the vessel through the water has the effect of depressing the surrounding water.

The most abrupt change of trim occurs at V/L — 1.2, called the critical speed, it being the speed at which change of trim occurs most rapidly.

Squatting is generally thought to cause great resistance and make a ship hard to drive. Squatting is never a cause, but rather a symptom of resistance, and is the result of large bow wave resistance.

When V/L — 1.2, the first hollow of the bow wave is about amidship, the second crest being farther aft and holding the stern up. When the speed is increased, this crest moves aft and clear of the vessel, the hollow moving aft as well. The stern then drops into this first hollow of the bow wave, causing the squatting. With further increase of speed, the hollow, in which the stern is running, moves aft, and the next crest of the bow wave takes its place, the vessel riding along on the crest of her own bow wave. With higher speed, the bow wave is longer and the vessel closer to the crest. This higher speed is not always possible, due to the lack of power and the squatting cannot be eliminated.

It is true that squatting means great bow resistance, and if this bow wave could be prevented, there would be no squatting. It will be noticed that ships

which are fine forward have small bow waves, while fuller ships have a more noticeable bow wave.

The above results are for deep water, the minimum depth at which water may be considered deep being equal to 10 H V/L, when H — draft in feet of vessel.

In shallow water, the change of trim begins at lower speeds and is more pronounced than in deep. The shallower the water the lower the critical speed at which an abrupt change of trim begins. At high speed in shallow water, the stern settles and the bow rises more than in deep, but at very high speeds (not generally obtained) the stern does not settle, nor the bow rise as much as in deep, due to the planing effect which causes the ship to rise bodily.

To get a small bow wave in a slow-speed boat (V/L = .9, say) the vessel should be full amidship and fine at the ends. At higher speeds, however, the middle body section should be reduced, and the displacement which is here taken off should be put on the forward sections, because, at high speeds, the whole forward half of the vessel makes the wave, while at slow speeds the forward quarter makes the bow wave.

Careful design of the after end of the ship is also important. Vessels of the cruiser type, with whaleboat stern, should not be too fine aft, as this tends to increase squatting, due to the vessel not having sufficient bearing on the water to carry her on the wave.

On small boats with "fantail" sterns, squat-pans have been used to increase this bearing, but, of course, while these may reduce the change of trim, they add considerable resistance due to skin friction.

The action of the propeller also affects the change of trim. It is evident that the water going to the propeller ultimately comes from the surface, and coming from the surface causes a depression there. This depression is a maximum just aft of the propeller, and the greater the ship, and the finer the pitch, the greater this depression. As a propeller of fine pitch or large slip exerts a greater thrust at a given speed of advance and slip than a coarse-pitched propeller of small slip. Many cases of squatting may be remedied by the use of a propeller of fine pitch operating with 12-15% slip.

WILLIAM M. MILLS,
Hammond, N. Y.

Not Due to Shaft Angle.

A FAIR idea of what is meant by "squatting" may be gained by considering the accompanying sketches. The causes for this peculiar property in certain types of draft has brought forth many interesting discussions in "Boating Circles." It has often been stated that an excessive rake on the propeller shaft, due to setting the motor well aft, causes the propeller to draw the water outward from under the boat, thus allowing the stern to settle. This, however, is not wholly true, as the water being drawn away from the boat would have an upward thrust on the propeller which would also have a tendency to raise the stern.

Having had occasion to sail several times of late in a boat that possesses this feature, I have had opportunity to note its actions both while aboard and from the landing. The boat in question is one of the fantail stern type (Fig. 1) 21 feet in length and 63 inches beam, with a two-cylinder motor, rated at 15 h.p., installed well aft, and equipped with an arrangement which allows two speeds.

As the motor is speeded up with the first or low speed "working" the settling is at once noticed (Fig. 2), yet nowhere near as much as when the second or high speed is engaged (Fig. 3), for then the drop at the stern is suddenly great and at the same time the bow used considerably. The average speed attained by the boat when under full power is about 9 miles per hour.

In this, as it is in most all cases, the squatting is due wholly to the design of the boat at stern and the excessive power of the motor. Should the engine be changed to one of 8 or 10 h.p., the speed would hardly be affected and the settling reduced. True, the design or shape of the stern could be altered and the difficulty greatly overcome; however, as this would incur added expense and as "squatting," with exception of the appearance given the boat, in many cases is not as detrimental as supposed, so the reduction of the power plant should be tried first. This, therefore, brings out that "squatting" lies chiefly in the form of the hull and to eliminate it care should be taken in first designing the craft.

C. E. BRADLEY.

Fitting Squat Boards.

THE amount of power used, proportion of beam and draught, to length, all have their influence on squatting, but the main cause is the shape or form of the stern. If this overhangs or slopes aft and upwards from the water, as in the old "fantail" round stern, or in some of the more modern canoe or whaleboat type of stern, then the water seems to cling to and follow up, this overhanging part. In this way, the water is elevated and formed into a wave, the stern settles into the hollow and the crest or high part follows a few feet astern.

If the boat is driven at any reasonable speed it will continue to settle until there is no more overhanging surface for the water to follow up, or until a balance is reached between the buoyancy of hull and the tendency of the water as it leaves the stern to pull downward on the overhanging portion.

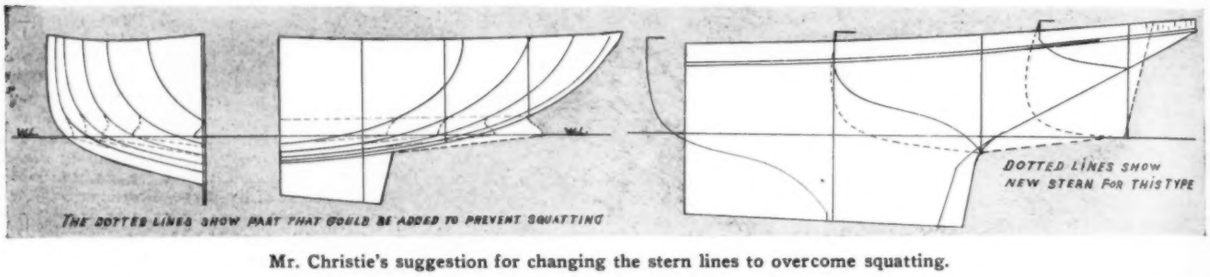
As squatting is caused principally by the form of stern, the only practical way to prevent it is to change the lines so they will rise in an easy curve to the desired waterline at the stern, and end abruptly so there will be no more surface for the water to follow.

The sketches will show how this may be done on different types of stern. The pieces shown by the dotted lines in sketch of the fantail and whaleboat stern may be worked out of one or more pieces of soft wood, such as white pine or cedar.

In attaching these pieces, have the bottom edge come where the waterline will be when the boat is loaded, then there will be a smooth wake and little tendency to settle farther. If the pieces are attached too low and the boat loaded so they are under water, then they will be of little use.

On some boats, such as narrow-sterned dories, flat planes or squat boards may be fitted. Care must be taken to have these at the proper height on hull; they should not be placed at too great an angle in an effort to raise the stern, or the drag will be excessive.

C. H. CHRISTIE,
Saginaw, Mich.



Mr. Christie's suggestion for changing the stern lines to overcome squatting.

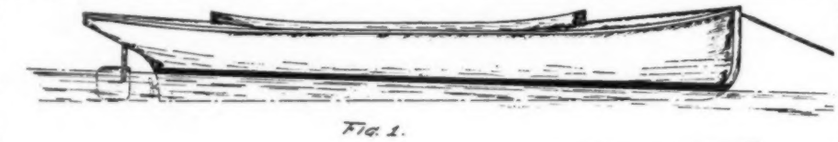


Fig. 1.

Fig. 2.

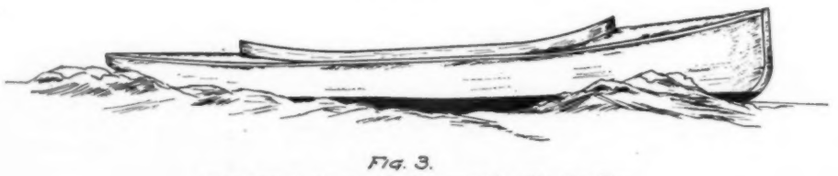


Fig. 3.

The fantail stern boat discussed by Mr. Bradley.

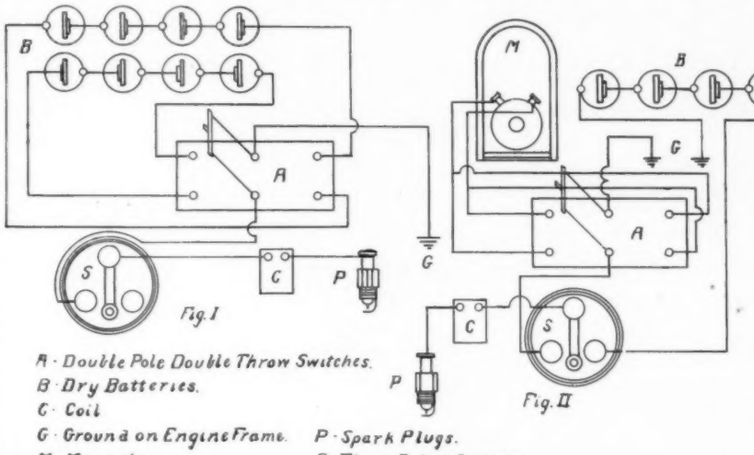
Caring for the Vibrator.

A Simple Wiring Scheme Whereby the Efficiency of the Ignition Circuit Can Be Greatly Increased.

By E. A. Crawford.

ALTHOUGH the popularity of the jump-spark system of ignition is rapidly increasing, yet how few realize that a little care and the proper adjustment of the vibrator spring on the coil will tend to increase its efficiency a hundred fold. A great many users simply take it for granted that as long as the coil will buzz and the spark will jump at the gap points of the plug that is all that is necessary, never giving a thought to any further adjustments. Where a magneto or a dynamo is used to generate the current this fact is not so important, but as perhaps ninety per cent. of the engine in use today, particularly of the smaller sizes, use either a storage battery or dry cells to supply the current, the question of how much current the coil is using is of vital importance, as on its consumption depends the life of the batteries. Properly adjusted a standard coil should pull anywhere from .5 to .7 of an ampere, while improperly adjusted many will consume as much as 2½ amperes. There is only one way to secure a correct adjustment and that is by testing with an ammeter, not one of the little pocket-battery ammeters, but a good reliable instrument having a scale reading in tenths or even smaller.

Another inconvenience in the use of the jump-spark ignition is the sticking and pitting of the vibrator points when using direct current as a source of energy. This evil is caused by the flow of current depositing particles of platinum from the positive point to the negative point of the vibrator which will soon cause the engine to "miss" frequently, if not stop altogether. There are several appliances manufactured to remedy this difficulty, but the accompanying drawing shows a simple and inexpensive outfit which may be wired up by any one following the diagrams shown.



A - Double Pole Double Throw Switches.
B - Dry Batteries.
C - Coil
G - Ground on Engine Frame. P - Spark Plugs.
M - Magneto. S - Three Point Switches.

Wiring plans for reversing the direction of the flow of current in a system using two sets of dry cells, also one using a battery and a low tension magneto.

Fig. 1 shows the wiring where batteries are the only source of supply. A represents a double-pole double-throw knife switch which reverses the flow of current and also alternates the use of the two sets of batteries by throwing from right to left. Fig. 1 gives the wiring where the batteries are only used to start the engine, as the magneto supplies the current while running. One side of the batteries in this diagram are connected direct to the three-point switch, no provision being being made to reverse the polarity of the current as they are intended only to be used a few minutes each time the engine is started. Both poles of the magneto are connected in multiple to the double-pole switch with the polarity reversed on each side. One blade of the switch is grounded on the engine frame while the other is connected to the three-point switch, which may be placed in any convenient place. Throwing the double-pole switch to the right causes the current to flow one way, while throwing it to the left reverses the polarity and allows it to pass through the coil in the opposite direction. By throwing this switch occasionally — say two or three times during a day's run — will eliminate this evil and prolong their life.

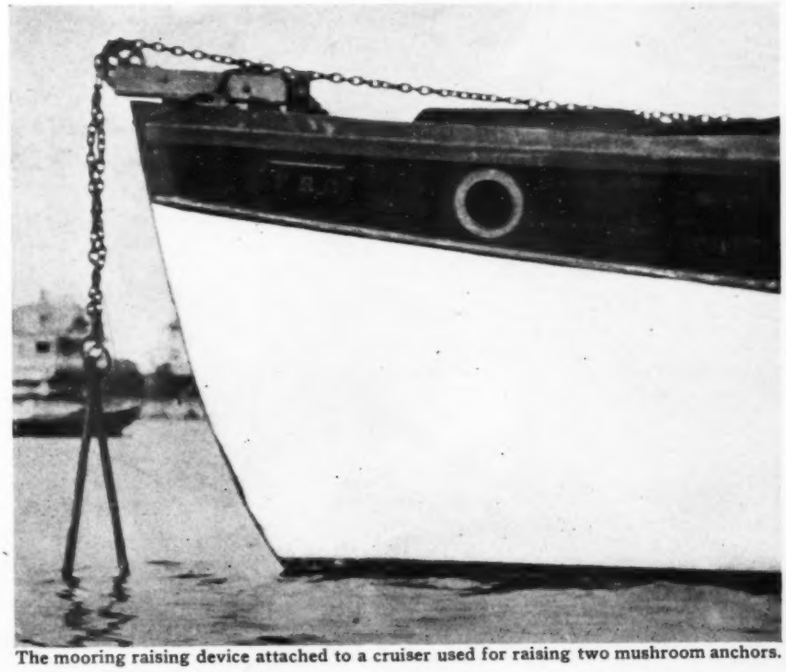
A Mooring Raising Device.

By O. R. Foster.

THE excellent articles in MoToR BoatinG about moorings give ideas which enable everyone to select a mooring suited to his needs. Usually no difficulty is experienced when placing a mooring in position. To raise one, however, is less easy for small boat owners, especially if the mooring is embedded in mud or sand.

The sketch shows a rig for raising moorings quickly, which is simple in construction and easy to operate. This novel apparatus was devised by Mr. J. Newton Gray, a member of the Sheepshead Bay Yacht Club, of New York City. It has been successfully used by himself and others this season.

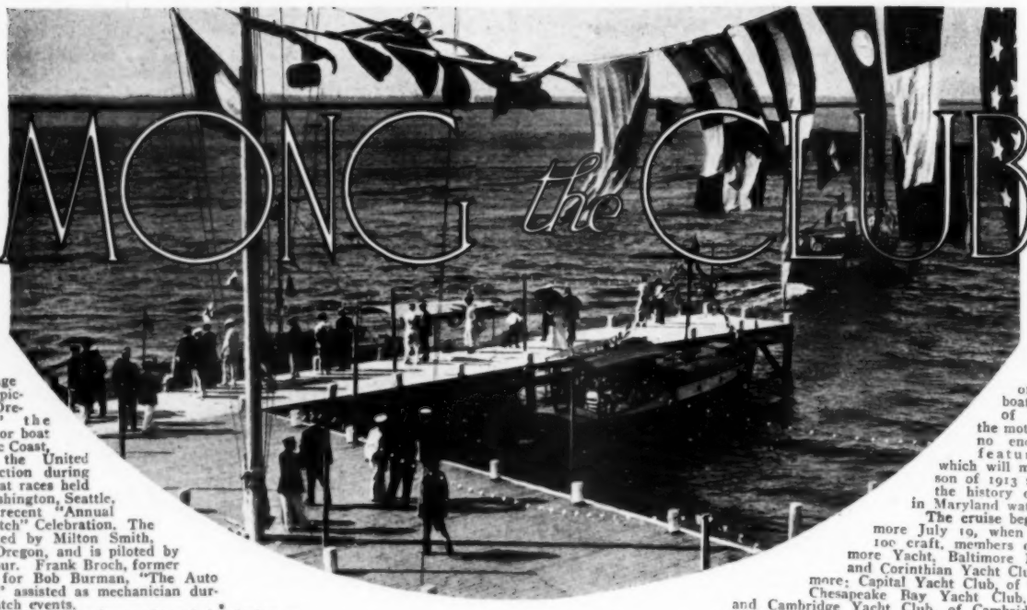
The accompanying sketches need little explanation. The pulley is 6¼ inches in diameter; the joists are 2 inches long and are held together by two ½-inch bolts. The length, of course, is governed by the boat on which it is to be used. The pulley support is made fast with a few turns of ¼-inch rope; a block and tackle fastened aft can either be tied to the mooring chain or attached with a shackle. The outfit can be used effectively on small open launches, as well as on the cruiser shown in the photograph.



The mooring raising device attached to a cruiser used for raising two mushroom anchors.

This device enables two men to raise a heavy mooring with ease. 250 lbs. can be raised without marring polished woodwork and without undue muscular exertion. A few weeks ago the writer experienced no particular difficulty when raising three moorings which had a total weight of 500 lbs.

AMONG the CLUBS



"Oregon Kid" at Potlatch Regatta.

On this page is shown a picture of the "Oregon Kid," the speediest motor boat on the Pacific Coast, if not in the United States, in action during the motor boat races held on Lake Washington, Seattle, during the recent "Annual Golden Potlatch" Celebration. The craft is owned by Milton Smith, of Rainier, Oregon, and is piloted by his son, Wilbur. Frank Broch, former mechanician for Bob Burman, "The Auto Speed King," assisted as mechanician during the Potlatch events.

This boat is claimed to be capable of developing a speed of 55 miles per hour, and during the races in Seattle succeeded in covering a lap of five miles in 6 minutes 45 6/100 seconds, establishing a record for motorboats in the Northwest, and beating the time made by the "Maple Leaf IV." when she won the International Harnsworth cup on Long Island Sound.

The "Oregon Kid" lost but one race during the meet, this being when it engaged in a 10-mile contest with Silas Christofferson, who piloted a hydro-aeroplane. Christofferson covered the distance named in 13 minutes 18 2/5 seconds, the motor boat coming in a few seconds behind its flying rival. This unique contest was the first of the sort to be held in the Northwest.

During the events the "Oregon Kid" won the following races and established records: 20-mile, free for all, 30 minutes 11 seconds, an average speed of 39.6 miles per hour; 20-mile, for 26-foot entries, 29 minutes 13 seconds, an average speed of 41.25 miles per hour.

* * *

Maryland Club's 200-Mile Race.

With eight boats in three classes the 200-mile race of the Maryland Motor Boat Club, which started at Baltimore July 25, and which carried the racing craft to Holland Bar lighthouse and return, was a success, especially as three club boats carried off the honors in their respective classes.

Louis Kann's 100-footer Kanised was first in Class A, defeating Marguerite II, owned by A. B. Cartledge, of the Keystone Yacht Club, and Jacob Mayer's 65 footer, Almax II, of the Maryland Motor Boat Club.

The boats were started on the evening of July 25 and were given their handicaps when they went over the line. Almax II was the first boat to go, leaving at 6:42. Marguerite II was next, leaving at 9:18 and 30 minutes later Kanised went after her rivals.

To within a few miles of Sharp's Island, 50 miles away, the three boats about held their relative positions, but shortly after the Almax II had to stop on account of engine troubles and she was overhauled by her competitors, which gained such a lead that they could not again be overtaken.

The elapsed time for the Kanised was 15 hours, 6 minutes and 40 seconds. Marguerite II's time was 15 hours, 50 minutes and 10 seconds.

In Class B there were but two entries—Myer Rosenbush's Scylla and T. A. Retalliata's Valiant, and the latter won with ease, her elapsed time being 19:19:05, as against 23:56 for the Scylla.

In Class C there were three entries, all under 37 feet, and the little boats put up a particularly scrappy race for nearly half of the race, after which they began to string out and the Scroggie owned by H. B. Little, of the Maryland Motor Club, walked home a winner by a good margin over her competitors—Usonia, owned by H. E. Leland, of the same club, and Bathurst, owned by Ralph F. Nolley, of the New York Motor Boat Club.

* * *

Copyright by Webster & Stevens.

"Oregon Kid," the new champion of the Pacific Coast, whose feats have been astonishing motorboatmen of that section.

Regatta Week on the Chesapeake.

The fourth annual cruise of the Chesapeake Bay Yacht Racing Association and the third annual regatta of the Cambridge Yacht Club, combined, July 19 to 26, was the greatest affair the yachtsmen of the Chesapeake Bay have ever had, for there was a solid week of racing by sailing craft for the entertainment of the power boat men, plenty of racing for the motor boats and no end of social features, all of which will make the season of 1913 stand out in the history of the sport in Maryland waters.

The cruise began at Baltimore July 19, when upwards of 100 craft, members of the Baltimore Yacht, Baltimore Motor Yacht and Corinthian Yacht Clubs, of Baltimore; Capital Yacht Club, of Washington; Chesapeake Bay Yacht Club, of Easton, and Cambridge Yacht Club, of Cambridge, gathered at the home of the first named club. The day was devoted to the racing of the sailing craft and the evening to a reception and a dance.

Sunday morning the fleet got under way and cruised to Annapolis, where they remained until the following morning, when they all started for Oxford, arriving there that evening to become the guests of the Chesapeake Club, which upheld its reputation for entertaining.

Tuesday was the power boat man's day, for there were races in all classes, from speed boats to heavy cruisers, and the several events were interesting, largely because they were closely contested.

The only feature to mar the excellent racing was the lack of ratings on some of the contesting boats. This did not detract from the interest in the races, but until the ratings are in, the winners will not officially be known. However that is at best a mere detail.

All of the classes got away in good shape together and the finishes were close enough to keep the interest at fever heat. After the races were finished all hands attended a crab roast on Oxford Point.

At sundown the fleet began to diminish in numbers as the yachtsmen pulled up their hooks and went to Cambridge. By eight bells on Wednesday morning, Oxford was deserted.

The summary of the day is:

Class A. Cruisers under 40 feet over all. 10 miles.

BOATS.	START.	FINISH.
Phy-lad-ma	11:00	12:11:22
Dorothy		12:12:20
Adios		12:12:55
Virginia II		12:16:38

Class B. Cruisers over 40 feet. 10 miles.

BOATS.	START.	FINISH.
Marguerite II	11:15	12:12:20
Free Lance		12:14:48
Achelous		12:16:15
Iona		12:17:44
Arjo		12:25:08

Class C. Speed boats. 10 miles.

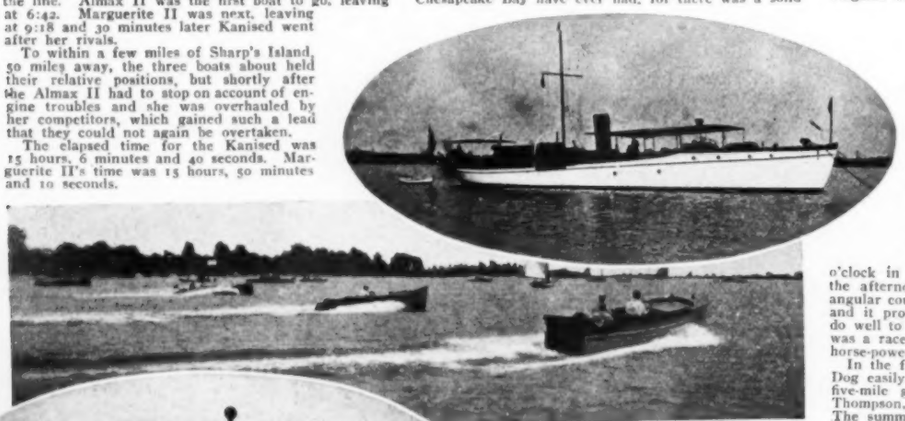
BOATS.	START.	FINISH.
Pocomoke	12:35	1:02:47
Buffalo		1:05:34
Sea Dog		1:07:20
Buzzaround		1:16:32

Never in the history of Maryland has there been a regatta such as was held at Oxford. There were 13 events, sail and power, and the program began at 10 o'clock in the morning and continued until late in the afternoon. The Cambridge Club adopted a triangular course for all power boats, except the cruisers, and it proved such a success that other clubs might do well to try it. One of the features of the regatta was a race between work boats equipped with 4 to 5 horse-power engines.

In the four cylinder class Dwight F. Mallory's Sea Dog easily defeated J. H. Lewis' Raymond D. in the five-mile grind. The Buffalo, owned by Raymond Thompson, having engine troubles and not finishing. The summary is:

BOATS.	START.	FINISH.
Sea Dog	10:55:10	11:11:05
Raymond D.		11:14:20
Buffalo		D. N. F.

The "Bumble Bee" class afforded interest and there were three starters, one owned by Commodore Alfred I. duPont and one by R. H. Matthews and one by I. E. Waddell, all of the Cambridge Yacht Club. The course for the little fellows was two miles. DuPont's



The upper and lower ovals show respectively "Kanised," winner in Class "A" of the Maryland Motor Boat Club's 200-mile race, and "Pocomoke," winner of the Class "C" speed boat event at Oxford. The center picture shows the start of the speed boat race at Oxford.

boat had magneto troubles just after finishing the first mile and Matthews crossed the line winner by 20 minutes. Waddell dropped out on the second lap.

In the three-cylinder class X. Q. Q., owned by E. E. Ward, of Crisfield, and the Louise, owned by William Cannon, of Cambridge, had a five-mile brush in which the former won by nearly three minutes.

A most interesting race was run between the A class cruisers Phy-lad-ma, owned by Wm. Hellbach, of the Baltimore Motor Yacht Club; Dorothy, owned by A. E. Kahler, Baltimore Yacht Club, and Virginia II, owned by L. E. Lambert, of the Cambridge Yacht Club. The Dorothy and Phy-lad-ma were particularly evenly matched and they finished only five seconds apart. The summary is:

5 MILES.	START.	FINISH.
Phy-lad-ma	3:21:00	3:51:20
Dorothy		3:51:25
Virginia II		3:52:54

It is believed that the Phy-lad-ma won, but this will not be certain until Mr. Kahler submits his rating.

The six-cylinder class would have had three entries could Mr. Charles Chance, of Annapolis, been able to get his Golden Arrow to run, but the Pocomoke, owned by R. T. Waters, of the Baltimore Yacht Club, and the Monkey, a new boat owned by Commodore Carlton Slagle, of the Baltimore Motor Yacht Club, had a five-mile spin together in which the Pocomoke was the victor by two minutes and 20 seconds.

In the big cruiser class A. B. Cartledge, owner of Marguerite II, and Arthur Thompason, owner of the Free Lance, got together and made up a handicap schedule of their own, the former giving the latter a start of one minute and 30 seconds over a 10-mile course.

* * *

The Cape May Race.

Ponce, the 60-footer of Philip F. duPont, of Wilmington, and Tocsam II, the Ocean City, Bermuda racer of L. Willard Mulford, both defeated the Marguerite II, the champion of the Delaware River in the Philadelphia to Cape May race on August 2. The Haji, the 35-footer of Commodore H. J. Dudley, of the Camden Motor Boat Club, defeated the Chelwood, which for two years has swept everything in her class. The Haji thus establishes her complete right to the championship of the Delaware for the "under 40-foot" class, which she won in the sanctioned race earlier in the season. Casino defeated the Clair III, of Camden, and Nereides, of Cape May, for the class under 40 feet rating over 45.

The race is almost without parallel in the history of motor boating for a number of reasons. It was a race in which correct navigation played an important point. There was an almost total absence of stragglers, and only a few boats under faulty navigation were late at the finish.

All the defeated boats did as well in the Philadelphia to Cape May race as they did in former races, but the winning boats did better, and thereon hinges the story of the making of new champions. Haji's record this year is phenomenal for the "under 40-foot" class. Ponce is a new boat and is doing better with every race. This is her third victory out of four important races, and the second time that she has defeated the Marguerite II.

The summary tells the story of the race.

* * *

CLASS A—Boats under 40 feet, rating under 45.

BOAT——OWNER——CLUB	RATING	TIME ALLOWANCE	CORRECTED TIME
Haji, H. J. Dudley, Camden Motor Boat Club	44.01	Scratch	10:47:00
Chelwood, R. K. Lenning, Keystone	38.48	1:17:45	10:54:21
Hyacinth, J. Morgan, West End, Chester	40.01	54:33	10:57:01
Mildred D, Rodney Davis, Camden	40.60	45:53	10:57:31
John M, Dr. Entwistle, Flat Rock	41.67	30:12	12:33:30
Elizabeth Bell, T. H. Greenwood, Philadelphia Canoe Club	37.68	1:41:29	14:34:51
CLASS B—Boats under 40 feet, rating over 45.			
Casino, William Erb, Columbia Yacht Club	49.66	7:38	10:03:23
Claire III, Dr. Drexler, Camden	50.54	Scratch	10:21:18
Nereides, Charles Miller, Corinthian of Cape May	45.00	58:06	11:47:18
CLASS C—Boats over 40 feet.			
Ponce, Philip F. duPont, Keystone	43.70	1:37:07	8:36:34
Tocsam II, L. W. Mulford, Ocean City Yacht Club	40.68	2:17:43	8:44:21
Marguerite II, A. B. Cartledge, Keystone	52.90	1:42	8:57:13
Mirna, Joseph Snellenburg, Ocean City Motor Boat Club	40.84	2:16:09	9:05:54
Albatross, Jules Levy, Yachtsmen's Club	46.47	1:04:02	9:46:43
M. L. E., F. B. Bower, Delaware River Club	45.68	1:13:05	9:55:57
Rosanna, F. I. Hill, Corinthian, Cape May	48.16	45:50	10:19:09
Cora II, R. Walter Starr, Corinthian, Cape May	53.06	Scratch	10:38:09

Red Bank Fair.

The Red Bank Motor Boat Club, of Red Bank, N. J., recently held a very successful fair and dinner. An unusual number of members and guests were present.

* * *

New Club Book.

The 1913 Club Book of the Waterway League of Greater New York and Long Island shows the enrollment of the following officers: President, Wm. S. Boyd; First Vice-President, Joseph B. Acker; Second Vice-President, Herman A. Metz; Third Vice-President, Joseph W. Masters; Treasurer, Edw. C. Schiffmacher; Secretary, Otto B. Schmidt; Assistant Treasurers, F. J. Robinson, Wm. Van Waandt; Assistant Secretary, John McGrath; Recording Secretaries, Robert C. Kerr, Jr., and Butler C. Pfeiffer; Chaplain, Rev. John Williams.

* * *

Chelsea Yacht Club's Big Event.

The annual open regatta of the Chelsea Yacht Club was held on Saturday, August 9th. Elaborate preparations were made and the affair was a great success. Boat races took place in the afternoon, followed by a dinner and lantern dance in the evening.

* * *

New England Dinner.

Steward Joseph J. Sheehan, of the Eastern Yacht Club, Marblehead, in planning to give the German sonder yachtsmen some New England shore dishes, which are certain to please them. His success in serving clams and lobsters in novel forms is assurance of the fact that when the Germans go up against Yankee sea food for the first time they will have the best.

* * *

B. R. T. Races September 10th.

September 10th has been definitely fixed as the date of the international motor boat race, according to a cable message received by Commodore H. H. Melville, of the Motorboat Club of America, from the Royal Motor Yacht Club. The postponement, asked for by the American Club, was desired on account of engine trouble, met with by the American boats during trial races on Huntington Bay, L. I., recently. The delay clears the way for Ankle Deep to go abroad as representing this country. Neptune IV, owned by L. D. Buhl, of Detroit, probably will be ready to demonstrate her speed within the next few weeks, and there are several other candidates whose chances are greatly improved by the additional time granted.

* * *

Races at Buffalo Launch Club.

The fifteen-mile team relay race proved the chief feature of the power boat programme. In this event a spirited contest was realized between the Major II and Fleet Captain, Harry D. Elliott's Red Head.

* * *

News from New Haven.

Yachtsmen at Morris Cove and such members of the colony who want a breakwater built off the entrance to the little bay have not given up hope of getting it in spite of Representative William S. Pardee's reverses in the recent legislature. They are going about it in a different way now. It is stated that the yachtsmen will try to have the Federal Government give permission for the stone to be taken from the useless and dangerous old jetty off Sandy Point, provided this state will pay for the work of putting it where the yachtsmen want it. The harbor commission and the yachtsmen who endorsed the movement for a Norris Cove breakwater think the Federal Government would be glad to get rid of even part of this jetty, about which there is so much just complaint from all frequenters of the harbor, provided the stone was used to build a useful breakwater. The cove breakwater supporters think that at another session of the legislature they could get the members to agree to an expenditure by the state for the building of the breakwater, provided the Government furnished the stone, as above outlined.

* * *

Yacht Club Acts as Host.

The Atlantic City Yacht Club entertained the Island Heights Yacht Club upon the finish of their cruiser race to that city, August the first. A reception and dance was given for the members and their friends from eight to twelve o'clock.

* * *

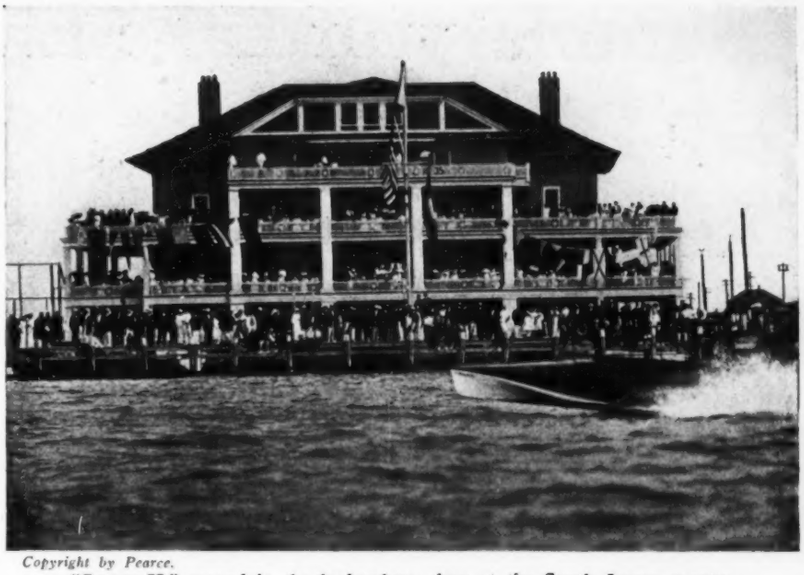
Big Regatta at Keansburg.

Motor boat enthusiasts in large numbers attended the Regatta of the Keansburg Yacht Club. The bay was dotted with various crafts, gaily decorated, races held over a course opposite steamboat pier, good time made in the races. The Jessie M. H., owned by A. L. Miller, a member of the Red Bank Motor Boat Club, captured first place in the three-mile free-for-all for cabin boats. The Jessie is a beautiful little boat, and covered the three miles in fifteen minutes and 10 seconds. The Dubee III was second in 16 minutes. This boat is owned by William H. Wincapaw, of Tottenville, and sailed under the colors of the Bently Yacht Club. The Martha, owned by W. A. Gill, of the Keyport Yacht Club, finished third, 11 seconds behind the Dubee III. The Onaway, owned by Thomas Edwards, of the Eureka Yacht Club, of Newark, finished fourth in 17 minutes. The free-for-all race for semi-speed boats over a three-mile course was won by the Rankin in 9 minutes. This boat belongs to a Mr. Rankin, of the Bently Yacht Club, of Tottenville.

* * *

Large Gathering at Ventnor Yacht Club.

The Ventnor Yacht Club was recently the scene of a customary society gathering and a large crowd enjoyed thoroughly the hospitality of the spacious clubhouse, which is situated at the head of Derby Place. Dancers whiled away the hours with both the old and new steps and everywhere good fellowship prevailed.



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"Cyram II," second in the hydroplane class at the South Jersey regatta.

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The upper and lower ovals show respectively "Tocsam II," winner of the cruiser race for boats over 45 feet, and "A. F. B.," winner in the hydroplane class at the South Jersey Regatta. In center: Class "B" at Oxford, Md.

Summary of Lake Erie Regatta.

International World's Championship for N. A. E. and B. M. Trophy, 30 Statute Miles, Toledo, Ohio, July 28, 1913. Free-For-All.

Boat	Owner	Motor	Elapsed Time 1st Heat	2nd Heat
Peter Pan V	J. Simpson	180 H. P. Van Blerck	47-00	1-17-08
Hazel II	A. E. Smith	2-106 H. P. Curtiss	1-05-59	D.N.F.
Whiz, Jr.	C. E. Crawford	180 H. P. Van Blerck	D.N.F.	D.N.S.

Trophy won by Peter Pan V; third heat not started. Best speed for heat 38.3 miles per hour.

National Championship Trophy for Open Boats Over 40 Feet in Length, A. P. B. A. Handicaps, 21 Statute Miles, Toledo, Ohio.

Boat	Owner	Motor	Elapsed Time. 1st Heat	2nd Heat	3rd Heat
Chinook	C. B. Lockwood	Scripps	1-13-17	1-09-29	1-08-15

Best speed for heat: 18.5 miles per hour.

Interstate Championship Trophy for Open Boats Under 32 Feet in Length, A. P. B. A. Handicaps, 21 Statute Miles, Toledo, Ohio.

Boat	Owner	Motor	Rating	Elapsed Time 1st Heat	2nd Heat	3rd Heat
Red Devil	O. P. Demars	Loew Victor	68.4	56-20	58-37	56-10
Cinderella	G. H. Glover, Jr.	Van Blerck	81.0	1-11-25	50-53	45-46
Scat	F. R. Mabbett	Pierce Budd	57.2	1-23-26*	56-02	48-05
Aunt Ty	T. A. Sinclair	Vim	....	1-14-43	1-20-54	1-19-18
Whiz	C. E. Crawford	Sterling	82.25	D.N.F.	D.N.S.	D.N.S.
Bull Moose II	F. J. Gregory	Roberts	68.4	D.N.F.	D.N.S.	D.N.S.

Interstate trophy won by Red Devil, second prize won by Cinderella. Best speed 27.6 miles per hour. *Scat disqualified first heat for not turning correct buoy.

Free-For-All for Boats Under 26 Feet in Length, 10 Statute Miles, Toledo, Ohio, July 29, 1913. Start 10.45 A. M.

Boat	Owner	Motor	Elapsed Time	Speed
Hazel II	A. E. Smith	200 H. P. Curtiss	13-52	43.2
Kitty Hawk, Jr.	H. H. Timken	125 H. P. Van Blerck	14-03	42.6
Peter Pan V	J. Simpson	180 H. P. Van Blerck	15-45	38.1
Scat	F. R. Mabbett	Pierce-Budd	22-07	27.2
Whiz, Jr.	C. E. Crawford	180 H. P. Van Blerck	D.N.F.	....

First prize, value $125, won by Hazel II. Second prize, value $75, won by Kitty Hawk, Jr.

Free-For-All for Boats Under 20 Feet in Length, 10 Statute Miles, Toledo, July, 29, 1913. Start 11.30 A. M.

Boat	Owner	Motor	Elapsed Time	Speed
Kitty Hawk, Jr.	H. H. Timken	125 H. P. Van Blerck	14-15⅗	42.1
Peter Pan V	J. Simpson	180 H. P. Van Blerck	15-41 4-5	38.2

First prize, value $100, won by Kitty Hawk, Jr.

Free-For-All for Boats Under 26 Feet in Length, 10 Statute Miles, Toledo, Ohio, July 29, 1913. Start 1.30 P. M.

Boat	Owner	Motor	Elapsed Time	Speed
Hazel II	A. E. Smith	212 H. P. Curtiss	14-03	42.6
Kitty Hawk, Jr.	H. H. Timken	125 H. P. Van Blerck	15-25	38.9
Baby Reliance III	J. S. Blackton	250 Pierce Budd	15-40	38.2
Scat	F. R. Mabbett	Pierce Budd	22-48	26.3
Whiz, Jr.	C. E. Crawford	180 Van Blerck	D.N.F.	....

First prize, value $125, won by Hazel II. Second prize, value $75, won by Kitty Hawk, Jr.

Free-For-All for Boats Under 20 Feet in Length, 10 Statute Miles, Toledo, Ohio, July 29, 1913. Start 2.30 P. M.

Boat	Owner	Motor	Elapsed Time	Speed
Baby Reliance II	J. S. Blackton	180 Sterling	13-18	45.1
Kitty Hawk, Jr.	H. H. Timken	125 Van Blerck	14-38	41.0

First prize, value $100, won by Baby Reliance II.

Free-For-All for Boats Under 26 Feet in Length, 10 Statute Miles, Toledo, Ohio, July 29, 1913. Start 3.30 P. M.

Boat	Owner	Motor	Elapsed Time	Speed
Baby Reliance II	J. S. Blackton	180 H. P. Sterling	13-23⅗	44.8
Hazel II	A. E. Smith	212 H. P. Curtiss	14-02	42.7
Kitty Hawk, Jr.	H. H. Timken	125 H. P. Van Blerck	14-12	42.2
Scat	F. R. Mabbett	Pierce-Budd	.....	....

First prize, value $125, won by Baby Reliance II, average speed 44.8 miles per hour.

Free-For-All for Boats Under 20 Feet in Length, 10 Statute Miles, Toledo, Ohio, July 29, 1913. Start 4.30 P. M.

Boat	Owner	Motor	Elapsed Time	Speed
Kitty Hawk, Jr.	H. H. Timken	125 Van Blerck	14-52	40.4

First prize, value $100, won by Kitty Hawk, Jr.

Perry Centennial, Free-For-All, All Classes, 30 Statute Miles, Toledo, Ohio, July 29, 1913. Start 5.30 P. M.

Boat	Owner	Motor	Elapsed Time	Speed
Kitty Hawk V	H. H. Timken	250 Van Blerck	41-20	43.6
Kitty Hawk, Jr.	H. H. Timken	125 Van Blerck	43-47	41.1
Peter Pan V	James Simpson	180 Van Blerck	46-22	38.8
Thelma	Thelma Motor Co.	Thelma	56-02	31.1
Scat	F. R. Mabbett	Pierce-Budd	1-07-24	26.3
Hazel	A. E. Smith	212 Curtiss	D.N.F.	....
Baby Reliance II	J. S. Blackton	180 Sterling	D.N.F.	....

First prize, value $1,500, won by Kitty Hawk V. Second prize, value $800, won by Kitty Hawk, Jr. Third prize, value $500, won by Peter Pan V.

Best average speed 43.6 miles per hour. Best 10 mile lap 47.2 miles per hour.

Match Cruiser Race, 33 Statute Miles, Put-In-Bay, August 1, 1913.

Boat	Owner	Elapsed Time
Speejacks	A. Y. Gowan	1-07-31
Shadow	Carl Fisher	1-12-05

Speed of winner, 29.4 miles per hour.

Bang and Go Back Races for Cruisers, Put-in-Bay, July 30, 1913.

Class D. Cruisers 60 Feet and Over.

Boat	Owner	Length, feet	Elapsed Time
Thelma	W. R. Huntington	65	1-03-45
Niagara	C. Kotcher	80	1-04-05
Clarinda	A. Stevens	98	1-06-53
L. E. R., Jr.	H. Strobel	62	Penalized

First prize, value $100, won by Thelma. Second prize, value $60, won by Niagara. Third prize, value $40, won by Clarinda.

Class E. Cruisers 40 Feet to 60 Feet.

Boat	Owner	Length, feet	Elapsed Time
Cincinnatus	W. C. Kenneth	42	1-02-57
Barbara II	P. C. Jones	50	1-02-59
Red Feather	H. Affleck	50	1-03-16
Scout III	E. L. De Mooy	45	1-04-38
Theresa II	R. Bies	41½	1-04-40

First prize, value $100, won by Cincinnatus. Second prize, value $60, won by Barbara II. Third prize, value $40, won by Red Feather.

Class F. Cruisers Under 40 Feet.

Boat	Length, feet	Owner	Elapsed Time
Alice M.	33	W. F. Meyer	1-03-15
Ardath	36	C. Tuttle	1-03-25
Victoria	30	J. F. Hauser	1-03-48
Nomad	36	W. Seitz	1-04-00
Comfort	35	F. W. Summerfield	1-04-09
Weona	32	P. Riley, Jr.	1-04-04
Aurora	36	J. C. Miller	1-04-33
Louise	38	C. Y. De Mooy	1-04-40
Independent	32	Paul Jones	1-04-42
Crescent	34	M. Beckley	1-04-46
Stormy Jim	..	H. Peters	1-06-36

First prize, value $100, won by Alice M. Second prize, value $60, won by Ardath. Third prize, value $40, won by Victoria.

Bang and Go Back Races for Open Boats, Put-In-Bay, July 31, 1913.

Class L. Open Boats Under 20 Feet.

Boat	Owner	Elapsed Time
Fritzie	L. Pheumelle	44-22
Swastika	F. Squires	45-58
Scat	F. R. Mabbett	.....

First prize, value $100, won by Fritzie. Second prize, value $60, won by Swastika. Third prize, value $40, won by Scat.

Class R. Open Boats 20 Feet to 26 Feet.

Boat	Owner	Elapsed Time
Twilldo	W. C. Willard	39-58
Anona	J. Dusenden	40-16
Echo III	W. Thievs	40-27
Teaser	J. P. Smith	40-38
Priscilla	Worthington	41-18
Topsey	R. W. Hart	41-34
U & I	C. R. Frator	41-35
White Diamond	Reute	42-23
Brown Betty	R. Lewis	43-25
Zampa	F. W. Eiche	43-25
Red Devil	O. P. De Mars	D.N.F.
Vim	E. Miller	D.N.F.
Thelma IV	Thelma Motor Works	D.N.F.

First prize, won by Twilldo. Second prize, to Anona. Third prize, to Echo III.

Class S. Open Boats 26 Feet to 32 Feet.

Boat	Owner	Elapsed Time
Nankypoo	E. C. Richardson	40-15
Wiborad	A. H. Dehnel	42-05
Physalia	A. E. Baker	43-00
Comanche	W. Frantche	D.N.F.
Helen T.	A. Trieber	D.N.F.

First prize, value $100, won by Nankypoo. Second prize, value $60, won by Wiborad. Third prize, value $40, won by Physalia.

Class T. Open Boats Over 32 Feet.

Boat	Owner	Elapsed Time
Craftsman	W. F. Meir	40-35
Commodore	W. Grenning	1-25-00

First prize, value $100, won by Craftsman. Second prize, value $60, won by Commodore.

Free-For-All Race for Open Boats, All Lengths, 33½ Statute Miles. Put-In-Bay, August 2, 1913.

Boat	Owner	Elapsed Time
Cinderella	G. H. Glover, Jr.	1-17-11
Delphine	H. Dodge	1-20-13
Commodore	W. Grening	1-30-06
Craftsman	W. F. Meir	1-31-11
Red Devil	O. P. Demais	1-35-08
Chinook	C. Lockwood	1-44-22
Vim	E. Miller	1-51-46
Comanche	W. Frantche	2-24-56
Echo III	W. Threve	D.N.F.
Twilldo	W. C. Willard	D.N.F.
White Diamond	J. Reute	D.N.F.

First prize, value $250, won by Cinderella. Second prize, value $150, won by Delphine. Third prize, value $100, won by Commodore.

Length of course only approximate.

Free-For-All for Hydroplanes, All Lengths, 33½* Statute Miles, Put-In-Bay, August 2, 1913.

Boat	Owner	Elapsed Time
Peter Pan V	J. Simpson	1-01-33
Thelma IV	Thelma Motor Co.	1-08-25
Bull Moose II	F. J. Gregory	1-21-21
Scat	F. R. Mabbett	1-23-44
Van I	G. W. Lapp	D.N.F.

First prize, value $500, won by Peter Pan V. Second prize, value $300, won by Thelma. Third prize, value $200, won by Bull Moose II.

Length of course approximate.

Free-For-All for Cruisers, 33 Statute Miles, Put-In-Bay, August 2, 1913.

Cruisers Over 60 Feet.

Boat	Owner	Elapsed Time
Speejacks	A. Y. Gowan	1-52-05
L. E. R., Jr.	H. Strobel	2-08-50
Mildred III	E. Gray	2-34-15

First prize, value $200, won by Speejacks. Speed of winner, 17.7 miles per hour.

Cruisers 40 Feet to 60 Feet.

Boat	Owner	Elapsed Time
Red Feather	H. Gaffleck	3-00-18
Barbara II	P. C. Jones	3-00-54

First prize, value $200, won by Red Feather. Speed of winner, 11 miles per hour.

Cruisers Under 40 Feet.

Boat	Owner	Elapsed Time
Alice M.	W. F. Meier	3-16-26
Aurora	J. C. Miller	3-31-51
Wenona	P. Riley	3-32-31
Ardath	C. Tuttle	3-42-44

First prize, value $200, won by Alice M. Speed of winner, 10.1 miles per hour.

Cruiser Races for N. A. E. B. M. Trophies, Put-In-Bay, Ohio, August 1-3, 1913. A. P. B. A. Handicaps, approximately 26 Miles.

Cabin Launch Championship.

Boat	Owner	Motor	Rating	1st heat	2d heat	3d heat	Points
Barbara II	P. C. Jones	Ralaco	50.4	2-26-36	2-25-59	2-23-40	9
Scout III	E. L. DeMooy	Jaeger	47.2	2-48-44	2-40-58	D.N.S.	4
Cincinnatus	W. C. Kenneth	Ralaco	36.0	3-42-04	D.N.S.	D.N.S.	1

Motor Yacht Championship.

Boat	Owner	Rating	Elapsed time, 1st heat
L. E. R., Jr.	C. H. Strobel	70.4	2-04-14
Niagara	C. W. Kotcher	59.9	D.N.F.
Leonore II	M. B. Grover	59.4	2-30-12

From Motor Boating Readers

A Department for the Exchange of Ideas and the Discussion of Questions of General Interest
Editorial Opinion on a Number of Questions Submitted by Readers of the Magazine.

MoToR BoatinG's columns are open to its readers, not only for asking questions, but for placing before them other readers' ideas, results of experience, opinions, etc., that should be interesting or helpful to them; but the editor will not, of course, be responsible for any opinions expressed or statements made in such communications. The name and address of the writer must necessarily be given in every case to make an answer by mail possible (no anonymous contributions will be considered for publication), but names will be omitted in publishing the letters and answers where desired, in which case it is desirable that initials or other distinguishing signature be appended. Through the correspondence department, readers of the magazine may be of direct aid to one another in solving the problems of motor boating.

Finding Displacement.

To the Editor of MoToR BoatinG, *Sir:*

The writer is desirous of obtaining the displacement of a boat 100 ft. long, 17 ft. wide and 5 ft. draft. I understand that this question will be answered in next month's MoToR BoatinG Magazine. A. F. M.

[The displacement of a boat is as the name indicates, the amount of water that the boat displaces when floating at rest. This may be expressed in cubic feet or in pounds or tons and is equal to the actual weight of the boat itself. To obtain the displacement it is necessary to weigh the boat or calculate the volume of the water that the boat displaces, which is obtained from the lines of the boat's underbody. With the very meager data that you have given us it is absolutely impossible to calculate your boat's displacement but if you happen to have her lines and will refer to the April, 1912, issue of MoToR BoatinG, pages 19 to 22, you may readily calculate the displacement for yourself, remembering that the volume in cubic feet divided by 35 will give the approximate displacement in tons. A very rough idea as to the boat's displacement in tons equals

$$\frac{.55\,L \times B \times D}{35}$$

where

L is the length of the boat in feet,
B its beam,
D its mean draft,

which would make us believe that the displacement of your boat is in the neighborhood of 130 tons.]

Propeller for a Cruiser.

To the Editor of MoToR BoatinG, *Sir:*

I am somewhat puzzled as to the most efficient propeller to use on my cruiser and would much appreciate the benefit of your advice. My boat is 35'x8'3"x2'4" draft transom stern, designed and frame built by Defoe Boat and Motor Works, Bay City, Mich., stock design No. 1735. Raised deck cabin. I have a new 3-cylinder 4-cycle motor of local make, bore 6", stroke 6¼", which the maker guarantees will turn a 30"x36" wheel 425 r. p. m. As I cannot swing larger than a 26" wheel, I would like to know what, in your opinion, would be the best pitch to use in order to obtain the maximum speed and what would you estimate this speed to be. Would a wheel with a large blade area and moderate pitch be more effective than a very high pitched wheel?

C. H. C., New Orleans, La.

[We believe that if your 6-in. by 6¼-in. three-cylinder four-cycle motor can turn a 30-in. by 36-in. wheel at 425 r.p.m., you have a very good engine indeed, and one delivering as much power at least as one could expect. However, not knowing anything about the design of the engine, we are inclined to believe that the above wheel would be somewhat too large for your proposition. We would recommend one either 26 in. by 30 in. or 24 in. by 30 in. It might be well to purchase the larger wheel and if you find this is too large, a trifle can be cut off each blade to increase your revolutions to the desired point. We should say that one of wide blades and a pitch ratio of 1 to 1¼ would be better than one having a narrow blade and a high pitch ratio.]

Motor for a V-Bottom Boat.

To the Editor of MoToR BoatinG, *Sir:*

I have been a subscriber for your valuable magazine for three years and don't see how I could get along now without it. As I have noticed questions asked and answered through the columns, I thought I would try you, as I am in a little case of doubt. I built a 22-ft. V-bottom launch after plans given in March, 1911, number. It is of heavy construction, using ¾" planking, but otherwise same as plans. Now, the V's seem rather sharp. The extreme draft of it is 24 inches; i. e., at stern to bottom of keel and at the bow it has a draft of 12 inches. Do you think this excessive for this style of boat? I have never seen more than 4 or 5 V-bottoms and there are none around here except mine. Now for a little information in regard to my motor. I have a two-cylinder motor, 4" bore and 4" stroke, two cycle and of medium or average compression. This engine has a 1 3-16" crankshaft, 3 bearings each 4½" long, connecting rod bearing 1¾" wide. The wheel is 15" in diameter, 3" thick and 3" wide. Do you think this crank shaft strong enough to hold such a motor and what size propeller would you recommend using with this engine for the above boat? Engine is rated 8 h. p. at 600 r. p. m. Is this a conservative rating?

G. J. McQ., Hudson, Mich.

[We believe the plans shown in the March, 1911, number of MoToR BoatinG of the 22-ft. V-bottom boat are excellent and that the depth of the V is about right.

In regard to the size of your crank shaft, we should say that this is slightly below the average practice for this size of motor, as we do not believe it should be much less than 1¾ inches. Of course this does not mean that there is actual danger of fracture as it is probably strong enough to withstand any average load. We believe the rating of 8 h.p. at 600 r.p.m to be a conservative rating for this sized motor.

For a wheel for this boat we would advise one of three blades 16 inches in diameter by 24 inches pitch.]

Gearing Up the Propeller.

To the Editor of MoToR BoatinG, *Sir:*

As a constant reader of your magazine, I would like to have your advice on the following problem: My boat is a Hand V-bottom, 22 ft. long by 4 ft. 2 in. beam, with easy lines and of light construction. The engine is a two-cycle, three-cylinder 5x5, weighing 500 lbs., and developing 30 h. p. at 850 r. p. m., which is rated r. p. m. of motor. I am out for as much speed as possible and would like to know if I could get better results by gearing up propeller and what improvement in speed would result. Also size of propeller with or without gear, as advised.

E. A. L., Montreal, Can.

[We would not advise gearing the propeller as we cannot see how you could gain any benefit therefrom, provided you are able to use the proper diameter wheel with the engine connected direct without excessive shaft angle and with your engine located in such a position as to give the boat the proper trim. However, if you cannot meet all these requirements, then we should say gearing up the motor in such a ratio that the above requirements can be met, will be to your advantage.

For a direct connected shaft we would recommend a three-bladed wheel 18 inches in diameter by 30 inches pitch. Probably a two-bladed wheel 19 inches in diameter by 32 inches pitch will give you a slightly greater speed than the former but will not give you as smooth a running outfit, and so we give you both of the above, that you may choose between them. We should expect a speed of about 20 miles per hour with this outfit.]

The Brake Test.

To the Editor of MoToR BoatinG, *Sir:*

As a subscriber for your invaluable magazine, I would be more than pleased if you would answer the following: The horsepower about of an engine 4½ inches bore and 4 inches stroke, which ran 750 r. p. m. on the test with 64 lbs. pressure on the flywheel.

W. F., Brooklyn, N. Y.

[This all depends upon the diameter of the flywheel, which you have not given us and does not depend at all upon the bore or stroke. The horsepower from a brake test is found from the following formula: horsepower equals 0.000016 D x P x R where D equals the distance from the center of the shaft to the point where the pull is measured (this distance to be measured in a line at right angles to the direction of the pull). P equals the net pull in pounds, and R equals the revolutions per minute at the time the pull was measured.

From this you will be easily able to calculate the horsepower developed by your engine at the particular time you obtained 64 pounds. For example, if your flywheel is 20 inches in diameter, then the horsepower would be approximately 7½. In like manner the power may be calculated for flywheels of other diameters.]

Good Efficiency.

To the Editor of MoToR BoatinG, *Sir:*

I have a boat of the following dimensions: Length overall, 28'10"; length on waterline, 27'6"; beam, 5'2"; and beam on waterline, 4'7". She has a Capitol engine, two-cylinder, 4-cycle, bore 5¼", stroke 6", revolutions 575. Engine rated at 14 h. p., but makers claim it shows 17 h. p. on the brake. Will you kindly tell me what size and pitch of wheel to use with this boat to get the greatest speed. The wheel that came with boat was 18" diameter, 3 blades, 4¾" wide, but pitch was not marked on wheel. Boat makes about 11 miles with this wheel, but builder of boat claimed she would make 13½ to 14 miles, and I want to get that speed if possible. The boat is built of ¾" Louisiana cypress with oak ribs, etc., weighs, all complete with engine, about 1,900 lbs. Model seems O.K. as she cuts water well, throws no spray and rides the waves nicely. She makes pretty large waves at stern. Any information you can give me as to the best wheel for this boat will be greatly appreciated.

A. T. S., Columbus, Ky.

[We believe that if you are now obtaining 11 actual miles per hour, you are getting a very fair efficiency and we doubt whether this could be improved upon very much. Of course we cannot say exactly as we do not know the pitch of your present propeller but we believe that at least a mile increase in speed might be obtained by using a two-bladed propeller 20 inches in diameter by 32 inches pitch, at 575 r.p.m. This will not give you quite as smooth a running outfit as you have at present as considerable more vibration will occur, especially if your deadwood is very thick, but from your sketch we should judge that this is located at some distance from the propeller, which would tend to reduce the vibration to a minimum.]

A Converted Cat Boat.

To the Editor of MoToR BoatinG, *Sir:*

I have recently converted a Cape Cod cat boat into a power cruiser and would be glad if you would give me some information concerning the proper size wheel. This boat is 26½' overall, 8½' beam and draws about 30". As you may know, this style of boat has an overhanging stern and while at rest the boat is about 20' on the waterline and when running her stern settles down so she is practically 24' or 25' on the waterline. I have installed a Northway automobile engine, 4½x4½ four-cylinder, four-cycle. We have used this fall an 18x27 3 blade speed wheel which the engine turns at about 650 revolutions and gives a speed of between 9 and 10 miles per hour. With this wheel we have found that the engine seems to be overloaded and it is our intention to secure a wheel that will let the engine run a little faster and easier. We do not care so much about the speed, as 7 or 8 miles would be satisfactory. We are aware of the fact that with this boat we should have installed a heavy duty engine, but we had an opportunity to pick up this motor, so we will make the best of it.

H. R. H., Peoria, Ill.

[We agree with you that a change in propeller would not be amiss. Of course we realize as you do that the boat is considerably overpowered for this type of craft and your propeller is showing about 45 per cent. slip, which is excessive.

By speeding your engine up to around 900 r p.m. you should get a much smoother running outfit. For this speed we would advise a three-bladed propeller 17 inches in diameter by 17 inches pitch, which should give you a speed of practically the same as you are now getting.]

Speed of Cruisers.

To the Editor of MoToR BoatinG, *Sir:*

In looking over a recent issue of MoToR BoatinG I saw some data in regard to new boats which seems rather queer to me and I thought by writing you I might have some of the mystery cleared up. On page 50 is a 35-ft. cruiser-runabout of light and speedy build having 6'6" beam on the waterline, with a 30 h. p. engine a speed of 10 miles per hour is claimed. On page 52 is a 39-ft. speed cruiser which is 38'3" on waterline by 9' beam on waterline, draft 3'. This is evidently also built light and for speed and with 24 h. p. a speed of 10½ miles is claimed. On page 55 is a heavy built 43-ft. cruiser with a beam of 11' and a draft of 3'8" and yet with 25 h. p. a speed of 11 miles per hour is claimed. Now what interests me is whether the latter 43' cruiser will do 11 miles with 25 good horsepower. If the other data is correct, it seems doubtful to me, as the power in all three are nearly the same, while the types of hulls are entirely different. It is taken for granted that an engine of proper weight and speed is installed in each as suited to its purpose. What is your idea about this and how fast do you think the 43' cruiser will go with 25 h. p.?

R. W. G., Atlantic, Mass.

[We agree with you that it is rather hard to come to any definite conclusions as to the proper power to give a certain speed in many types of boats. For the design on page 50 we believe the speed estimate of 10 miles an hour is rather conservative and that it should go slightly above this, although this type of stern is not suitable for a much greater speed than 11 or 12 miles an hour without excessive power and although this particular boat appears to be of rather narrow beam.

The design on page 52, we believe, should go a little under 10 miles an hour with 24 actual horsepower.

The design on page 55 which is apparently of rather heavy construction, doesn't give any waterline measurements which are in reality a deciding factor rather than the overall dimensions. The designer here claims a speed of 11 miles per hour with a 25 h.p. heavy duty motor, while the preceding one expected his speed with a 24 h.p. motor. While on the face of it there may seem to be a difference of only one horsepower, yet in reality there may be many times this difference. The 25 h.p. motor is of four cylinders, 6 inches bore by 8 inches stroke, which, according to the American Power Boat Association Horsepower Rules, rates over 37 h.p., and we really believe that it is capable of developing this much power, which, although perhaps only rated 25 h.p. by the builders themselves, yet we consider should give this boat a good speed, but doubt if it would come up to 11 miles an hour. We estimate that 10 miles an hour is about all that would be possible to obtain with this hull and engine.

You will see that the three cases that you have mentioned differ widely in design, as you say, and yet make practically the same speed with the same power, but the trouble is not altogether with the claims of the designers, but with horsepower ratings given by the engine builders, which in the three cases cited, although all of them are rated at about 25 h.p., and range in actual developed horsepower from 37 down to 20, we should say, so you will see that it is necessary to analyze all the conditions entering in before deciding upon the proper power for the given speed.]

WaterproofingCanvas.

To the Editor of MoToR BoatinG, *Sir:*

Can you send me a receipt for making a waterproof solution so I can waterproof the canvas top of my new launch?

E. S., Syracuse, N. Y.

[This may be done by mixing together about a pound to a pound and a half of paraffine in a gallon of gasoline which has been previously warmed by allowing the vessel containing the gasoline to stand in an outer vessel containing warm water. As soon as the paraffine is entirely dissolved in the gasoline, it should be painted on to the canvas by means of an ordinary paint brush. The gasoline will soon evaporate, leaving the canvas thoroughly saturated with the paraffine, making it waterproof and possessing excellent lasting qualities.]

Power of a Motor.

To the Editor of MoToR BoatinG, *Sir:*

Though my subscription for your interesting magazine is but a short month old, my acquaintance with it is one of long standing; thanks to the happy medium of the newspaper stalls which gave me introduction to it. As one of the many who thirst for new "dope" as to the marine motor, I absorbed the matter in the question department and only read the other literature, and I must say that, though my boat is but small and my engine likewise, the answers therein have helped me out of many a hole. Hence, I take the liberty of submitting the following tale of woe, hoping that from the kindness of your heart and the depth of your wisdom, some light can be thrown upon the subject. My small craft is 22'9" by 5' with a draft of 12" at the bow and 23" at the stern. She is a Brooks 23' raking transom model with good clean lines, but practically no flare forward. The motor is one of the Ferro engines, generally made for use in the Mullin's boats, with three cylinders, bore 3½", stroke 3½", two cycle, and runs like a top. The propeller is a common type speed wheel, with diameter 16" and pitch 20". With this wheel the engine under load, at full speed, turns over about 700 or 750 r. p. m., and the boat makes but 9 miles per hour doing its best and with only one person in it. The bottom of the boat is as clean and smooth as it was on the day it was placed in estuary. She rises about 3" at the bow and squats about 5" when going at full speed. Now, could you help me out as follows: I feel that the boat has that very common illness—not enough speed for the power. Shall I change the propeller; if so, what size shall I get and what speed should I then expect? What is the actual horsepower of the motor and can you give a simple way in which to approximate the power of any engine? I wish to build a small hydroplane but cannot at present get another engine. Can you give a plan for one or let me know where I could get the knock-down frame of a small hydro which would give the best speed with the engine above described? At the bow the boat is very sharp and continues so for about 5' aft when the V becomes less pronounced until about 7' from the stern, where she is quite flat right onto the stern. She is not of the V-bottom type by any means and though a very seaworthy boat, her lack of flare causes her to plow through the waves instead of raising over them. If you could answer these questions in the columns of MoToR BoatinG, I would certainly esteem it a great favor.

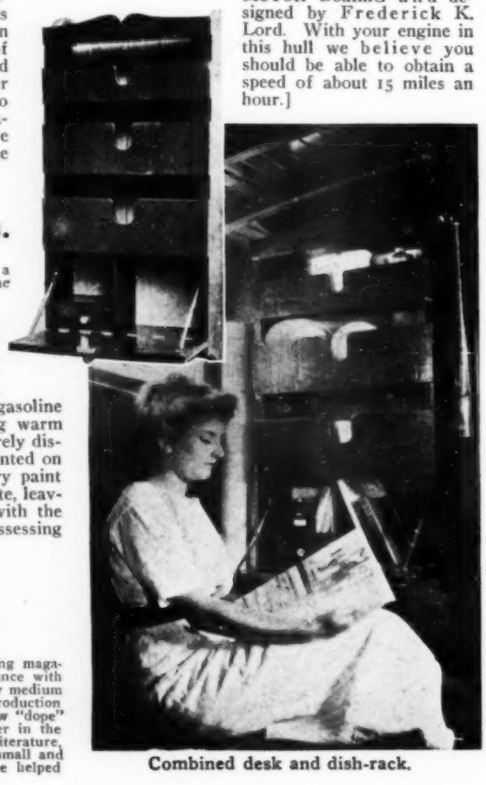
P. M. F., Oakland, Cal.

[We cannot agree with you altogether that you are getting poor efficiency with your outfit. Nine actual miles an hour while it may seem comparatively small, is about the average speed for boats of your type and if you are quite sure of this speed, we see no reason why you should not be fairly well satisfied. However, should you care to equip your boat with a two-bladed wheel 17 inches in diameter by 23 inches pitch, we believe you would get at least one additional mile in speed. The actual horsepower of your motor should be about 14 or 15 and while there is no accurate way of determining the horsepower other than the brake test, yet for an engine of good design the following formula will work out very well for two-cycle motors:

$$\text{h.p.} = \frac{B^2 \times S \times N \times \text{R.P.M.}}{10{,}000}$$

where B equals the bore in inches, S the stroke in inches, N the number of cylinders, and R.P.M. the revolutions per minute.

In regard to a new hull for your present engine, we would suggest that you try the one described in the May and June issues of MoToR BoatinG and designed by Frederick K. Lord. With your engine in this hull we believe you should be able to obtain a speed of about 15 miles an hour.]



Combined desk and dish-rack.

Determining Horse Power.

To the Editor of MoToR BoatinG, *Sir:*

Would you kindly enlighten me on how to find the real horsepower of any motor when given the bore and stroke?

H. S. M., Hamilton, Ont.

[Of course you realize that additional factors besides these are necessary to determine the real horse power. For example, the revolutions per minute and the number of cylinders must be known, and to determine the true horsepower it will be necessary to know the mean effective pressure within the cylinder during the cycle. However, we take it from your letter that you simply desire a close approximation of the real horsepower rather than any actual or theoretical value.

For this a good formula to use is

$$\text{h.p.} = \frac{B^2 \times S \times N \times \text{R.P.M.}}{13{,}500}$$

for four cycle motors, where B is the bore in inches, S the stroke in inches, N the number of cylinders, and R.P.M. the revolutions per minute.

Several empirical formulas are often used, assuming an average number of revolutions. One of these which gives a close approximation is

$$\text{h.p.} = \frac{(B \times S)^2 N}{9.92}$$

This formula will over-rate the slow speed motors and underrate those that turn over a high number of revolutions per minute, but for the average motor will be about right.]

Route to Lake George.

To the Editor of MoToR BoatinG, *Sir:*

As I am going to take a trip from New York City to Lake George this coming summer, I would like to know if there is a navigable waterway from Lake Champlain into Lake George.

H. W. J., New York City.

[The nearest connection between these two lakes is from the head of Ticonderoga Creek, which runs into Lake George, at Fort Ticonderoga, which is about 30 miles north of Whitehall, the lower extremity of Lake Champlain. This creek is some 5 miles long and navigable by small boats and its head is about 3 miles from the northern end of Lake George, which distance it is necessary to carry. The level of Lake George is about 200 feet above the level of Lake Champlain, so most of this carry will be up hill. However, as this is a common route in the summer, transportation can be obtained from local truckmen for this work.

Another means of entering Lake George is from Glens Falls, which is some 10 miles south of the lower end of the lake. Glens Falls is reached via the Champlain Canal, leaving this body of water at Fort Edward, which is about 50 miles north of Albany and entering what is known as the Glens Falls Feeder, which is followed for a few miles to the city of Glens Falls, where again the boat must be transported over land into Lake George.]

Both Desk and Dish Rack.

To the Editor of MoToR BoatinG, *Sir:*

It is needless to state to a yachtaman that every inch of space on board of a cruiser should be utilized as far as possible. A surprising quantity of material can be stowed away in a comparatively small space if the necessary care is taken. A small cruiser not over 30 ft. in length, if provided with proper equipment, can be made very "homelike." The amateur, who is at all skilful in the use of ordinary carpenter's tools, may make, during spare time, much useful and durable equipment which will add immensely to the comfort of his craft. The expense is often very small.

The illustrations show how one corner of a small cruiser was made to serve several purposes. The dish rack can be used for the stowage of dishes for six people or more; the lower shelves are large enough to permit the entrance of ordinary screw cap Mason jars. In these jars tea, coffee, salt, flour, etc., can be kept in perfect condition even during a protracted wet spell. The top shelf is an excellent nook for spoons, knives, forks, etc.

The lowest compartment is a combined desk and book rack. The lid when pulled down becomes a writing place. Paper, envelopes and pens may be placed on the lefthand side; books and magazines on the right. During a cruise this desk compartment is useful for holding many small articles which are so easily lost. The rack shown in the illustrations is held in place against the bulkhead by brass hinges. It was intentionally made of such width that a space would be provided on the left for the stowage of charts. The charts are protected against dampness and spray by wrapping them in oil cloth; ordinary oil cloth makes an inexpensive and excellent "chart case."

The rack described in this article was made during spare time in the winter months. The first photo shows it finished, but before being placed in position on board. The second photo shows it in place on the starboard side of a 30-foot cruiser.

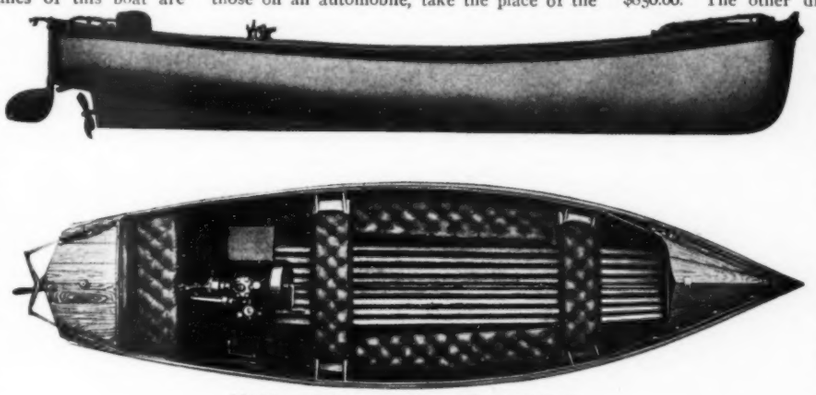
Readers of MoToR BoatinG do not need detailed directions for making such a simple outfit. The method of construction is obvious from the photographs.

O. R. Foster, Brooklyn, N. Y.

Boats of Stock Design

16-Foot Mullins.

THE W. H. Mullins Co., of Salem, Ohio, are now offering a special 16-ft. steel motor boat which is powered with a 3 h.p. Ferro motor. The frames of this boat are very substantial, heavy oak being used for the keel, ribs, bow and stern posts. This frame is covered by a one piece pressed steel skin and securely riveted in place. This covering, which corresponds to the planking on wooden boats, is made of heavy gauge puncture-proof galvanized steel and is practically indestructible, and consequently is not affected by weather conditions and will not dry out and leak. The gunwales, seats and all woodwork is either yellow pine or oak, which is worked down to a smooth finish, and given three coats of spar varnish. The decks are of oak and finished in the natural wood. The interior of boat where metal is exposed is finished in light green, outside of hull finished in aluminum.



Mullins 16-footer with 3 H. P. Motor.

Roomy, comfortable seats are fitted in the cockpit and are covered with suitable cushions. The power-plant is very complete, the motor being fitted with the Mullins silent under water exhaust, sight feed oilers, reversible contact timer, with speed control levers, automatic float feed carbureter, priming and relief cocks, solid bronze propeller, coil, wiring and batteries.

These boats are fitted with water-tight compartments which hold sufficient air to keep the boat and equipment afloat. Due to their buoyant and seaworthy qualities, these models make an excellent craft for hunting, fishing or for any purpose where a strong, compact, durable boat is required.

The general dimensions of the 16-foot special are beam 4 feet, draft 12 inches, length of cockpit 11 feet, 4 inches; seating capacity 8, speed 1¼ to 9 miles per hour. Price complete without extras $150.

pairs and particular pains have been taken to make each part of the motor entirely accessible. The spark and throttle controls are situated on the auto steering wheel, which is set at a convenient angle. Two foot-pedals, similar to those on an automobile, take the place of the usual clutch handle. On the after side of the engine compartment bulkhead a rear starting handle is swung, a sight feed oil glass is fitted and a Bosch dual short-circuit starting button is also in easy reach of the operator.

Aft of the steerman's seat is a large roomy cockpit fitted with rattan chairs.

27-Foot Cruiser.

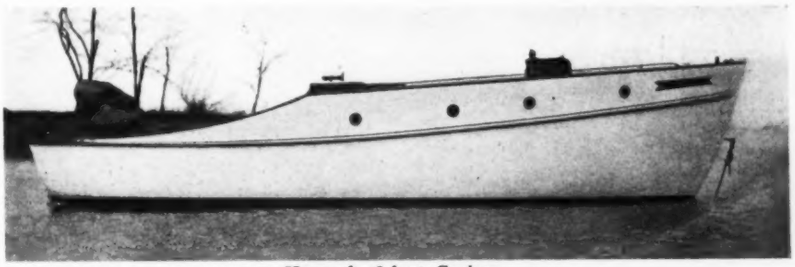
THE Howard Cruiser Works of Westfield, New York, are now making a specialty of a 27-foot cruiser, which they list at $850.00. The other dimensions are: Water line, 25 ft.; beam, 6 ft. 6 in.; draft, 2 ft. 2 in.; speed, 10 miles per hour.

For a small cruiser this boat offers very good accommodations for four persons. The cabin has good head room and the several ample ports insure an abundance of fresh air and light.

Good free board is carried well out on both bow and stern, and this, in conjunction with the fact that the underbody is fairly full, this particular type has proven entirely seaworthy, and safe in very rough water.

Toppan 26-foot Dory.

THE Toppan Boat Manufacturing Co., of Boston, Mass., have for several years been making a specialty of small motor boats of the dory type. The picture on this page shows a boat recently constructed for the MacMillian Expedition and will be used as a tender to the main supply boat in the vicinity of the North Pole.



Howard 26-foot Cruiser.

The construction of this boat is slightly heavier than the regular Toppan model. This was deemed essential to make the boat especially adapted to hard service and to withstand a certain amount of ice pressure. The boat is powered with a 12-14 h.p. 2-cylinder Toppan engine fitted with Paragon reverse gear. The gasoline tank is quite large, insuring sufficient fuel for an extended operating radius.

The Toppan Company build and keep in stock a complete line of small and large power dories which are adapted to any service where a powerful and seaworthy boat is required, and at a reasonable price.

35-foot Elco Express, 60 H. P., 24 miles guaranteed.

Elco 35-Footer.

THE 35-foot Elco express shown on this page is designed and built by the Elco-Bayonne Company, of Bayonne, N. J., and represents a highly developed, yet serviceable, type of boat for afternoon sailing, or for fast ferry service. The general dimensions of this boat are: Length over all, 35 feet; beam, 5 feet 2 inches; draft, 2 feet; seating capacity, 10 persons; speed, 24 miles per hour guaranteed. Mahogany is used throughout in the hull construction, which gives the boat an unusually attractive appearance, besides insuring strength and durability. This type of boat has proven to be entirely seaworthy and dry and capable of sustaining high speed in a heavy sea. The power equipment consists of a 6-cylinder, 60-70 h.p. Elco motor, 5 inch bore by 4¾ inch stroke. The cylinders are cast in

26-foot power dory for rough water.

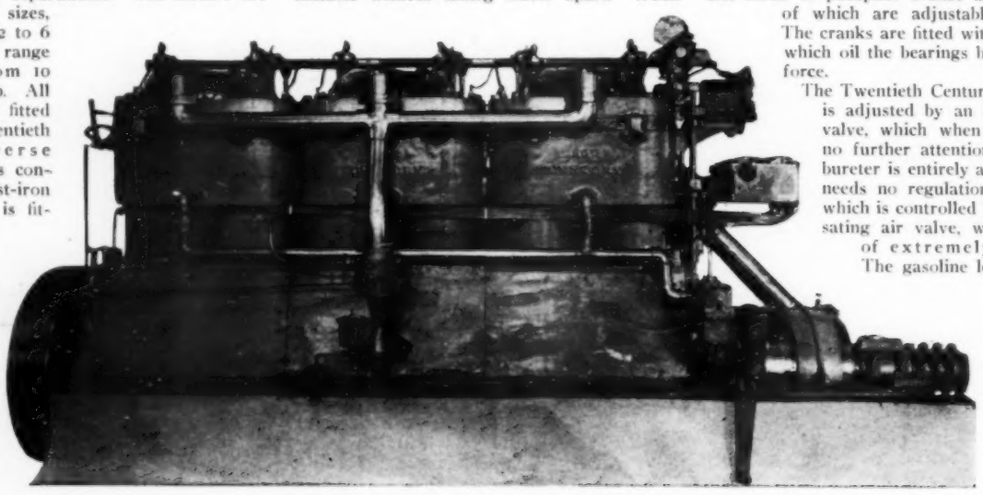
MARINE MOTORS

Twentieth Century Motors.

Are Equipped with Double Ignition, Air-Cooled Compressor, Multiple Force Feed Oilers, Water Jacketed Carbureter and Governor Control.

THE Twentieth Century Motor, built by the New York Yacht, Launch and Engine Company, of New York City, is constructed in full accordance with government requirements, and at the present time is used in five federal departments. The motors are made in 14 sizes, having from 2 to 6 cylinders, and range in power from 10 h.p. to 150 h.p. All models are fitted with the Twentieth Century reverse gear, which is contained in a cast-iron drum, which is fitted in the base of engine casting, and held rigidly in line. The power when the wheel is reversed is transmitted by means of beveled gears of ample proportion to size of motor. All cogs that revolve on spindles are bushed with phosphor bronze, said spindles being case-hardened and ground. The gears are encased in an oil-tight compartment. the clutch case is bolted securely to forward end of gear drum and is large in diameter, thereby giving large friction surface.

The reverse gear can be removed in a few minutes without taking motor apart. When motor is operating ahead under direct load the reverse gears are not in motion.



The 1914, 100 H. P., 8 by 10, 20th Century.

A special grade of high carbon steel hammered forging is used for the crank shaft and connecting rods. The cams, rollers and wrist pins are all made of hardened and ground steel, while the crank bearings are of phosphor bronze; the main bearings are of the best babbitt metal or phosphor bronze as desired, all of which are adjustable for wear. The cranks are fitted with ring oilers which oil the bearings by centrifugal force.

The Twentieth Century Carbureter is adjusted by an index needle valve, which when set requires no further attention. This carbureter is entirely automatic and needs no regulation of the air, which is controlled by a compensating air valve, which permits of extremely low speed. The gasoline level is maintained by a float, irrespective of pressure of fuel. An automatic governor keeps the engine under control at all times and prevents racing. This company makes a specialty of building large right and left-hand engines for twin-screw boats.

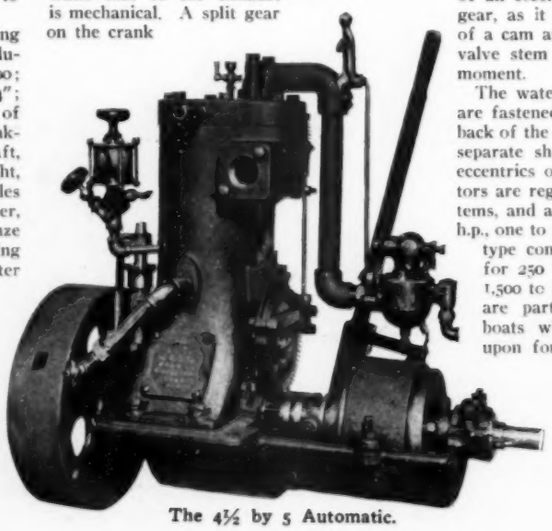
The 3-H.P. Four-Cycle Automatic.

Weighs but 300 lbs., Including the Reverse Gear. The Cylinder Has a 4¼ Inch Bore by 5 Inch Stroke, and the Length Overall Is 31 Inches.

THE Automatic Machine Company, of Bridgeport, Conn., are offering a small 4-cycle motor that is especially adapted to small work or fishing boats.

The motor is 3 h.p., and has the following dimensions: Bore, 4¼"; stroke, 5"; revolutions, minimum, 200; revolutions, normal, 500; length overall, 31"; width of bed outside, 14"; diameter of balance wheel, 14"; diameter of crankshaft, 1½"; height from center of crankshaft, 21½"; depth from center of crankshaft, 5¾"; diameter of exhaust pipe, 1½"; weight, 300 lbs. And the regular equipment includes the following: Reverse gear, 1"; carbureter, 6' of 1" bronze shaft, 16" 2 or 3-blade bronze propeller, bronze combination stern bearing and stuffing box, shaft coupling, muffler, water pump, make and break ignition, oil cup, priming cup, water inlet check valve, foundation bolts, lag screws, starting bar and wrenches.

The valves are large and easily removed. The inlet valve is seated in a cage, fitted in the cylinder head, directly over the exhaust valve. It is only necessary therefore to remove the gas manifold from the top of the engine, and lift up the inlet valve through the same opening, after taking off the nuts that are on the end of the valve stem. The action of the inlet valve is entirely automatic, while that of the exhaust is mechanical. A split gear on the crank shaft is in mesh with a larger gear that is fastened to the back of the cylinder by means of an eccentric stud. This second, or igniter gear, as it is called, moves a slide by means of a cam and roll that pushes up the exhaust valve stem and lifts the valve at the proper moment.



The 4½ by 5 Automatic.

The water and air pumps of the automatic are fastened to the bed of the engine directly back of the balance wheel, and are operated by separate shafts connecting the plungers with eccentrics on the crankshaft. Automatic motors are regularly fitted with two ignition systems, and are built in sizes from 3 h.p. to 250 h.p., one to six-cylinder units. The heavy-duty type consists of thirteen models, designed for 250 to 375 r.p.m., and weight is from 1,500 to 15,000 pounds each. These engines are particularly adapted to heavy work boats where the motive power is called upon for continued operation of, say, ten or twelve hours per day. Although automatic engines are noted for their power, still they present a symmetrical appearance. The small-sized motors are equipped with a clutch of the same design as those used on the larger power units and is entirely dependable.

The Two-Cycle Toledo.

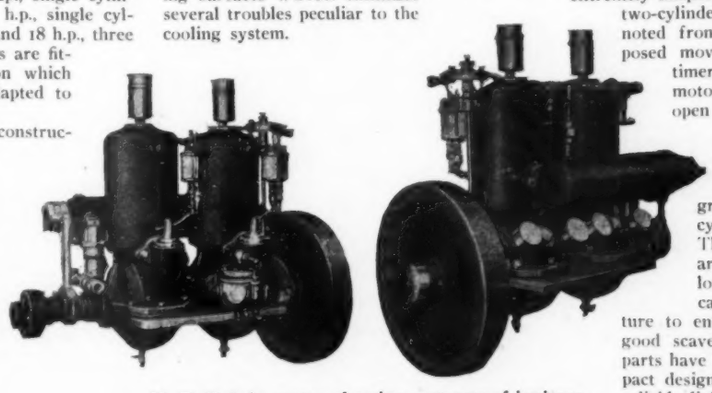
An Extensive Line of Powerful, Compact 2-Cycle 2-Port Engines Designed to Power Heavy Cruisers or Fast Boats.

THE Universal Machine Company, of Bowling Green, Ohio, manufacturers of the Toledo marine motors, state that they have recently added several improvements to their product and that, in consequence, the Toledo motor is now filling a long-felt want where a light-weight motor is required for constant service.

The Toledo is of the two-cycle, two-port type, having large, carefully proportion parts allowing flexibility of operation, and is made in five sizes, as follows: 3 h.p., single cylinder; 6 h.p., two cylinders; 6 h.p., single cylinder; 12 h.p., two cylinders, and 18 h.p., three cylinders. The Toledo motors are fitted with water-proof ignition which makes them particularly adapted to open boats.

Looking into the detailed construction of the Toledo we find that the several parts have been carefully considered. The cylinders are made of a special semi-steel mixture which, its makers claim, is much stronger than cast iron, and is of a closer grain, thus offering a smoother bearing surface and longer life. The cylinder, cylinder head and top of crank case are one casting, thus doing away with bothersome gaskets and compression leaks.

The pistons and rings are made of the same material as the cylinders and are ground to fit. Drop-forged steel is used for the crankshafts, which are accurately turned down from ample material. The crankshaft bearings are of best nickel babbitt metal. The connecting rods are fitted with removable, die-cast bushings, which can be easily replaced in case they run dry and melt out. The circulating pump is made of bronze throughout and has long bearing surfaces which eliminate several troubles peculiar to the cooling system.



12 H. P. Toledo motor showing waterproof ignitors.

Oiling and other details have all received special attention.

Toledo motors have a wide range of speeds, and the makers state that their engines are capable of taking the full load at from 200 to 1,200 revolutions per minute, although the rated horsepower is figured at 730 revolutions per minute.

Carrying out the policy of making their engines as reliable as possible, the Universal Machine Company have made these five sizes extremely simple. The illustration shows the two-cylinder 12 h.p. size and it will be noted from the cut that the only exposed moving parts are the flywheel, timer and pump. This makes the motor especially safe for small open boats.

The design of these engines is somewhat different from the ordinary type of two-cycle motor and the greatest power for unit of cylinder capacity is obtained. The exhaust and intake ports are unusually large which allow the exhaust gases to escape easily and the fresh mixture to enter quickly which insures a good scavenging effect. Many useless parts have been eliminated and the compact design of this motor permits of a reliable light weight engine.

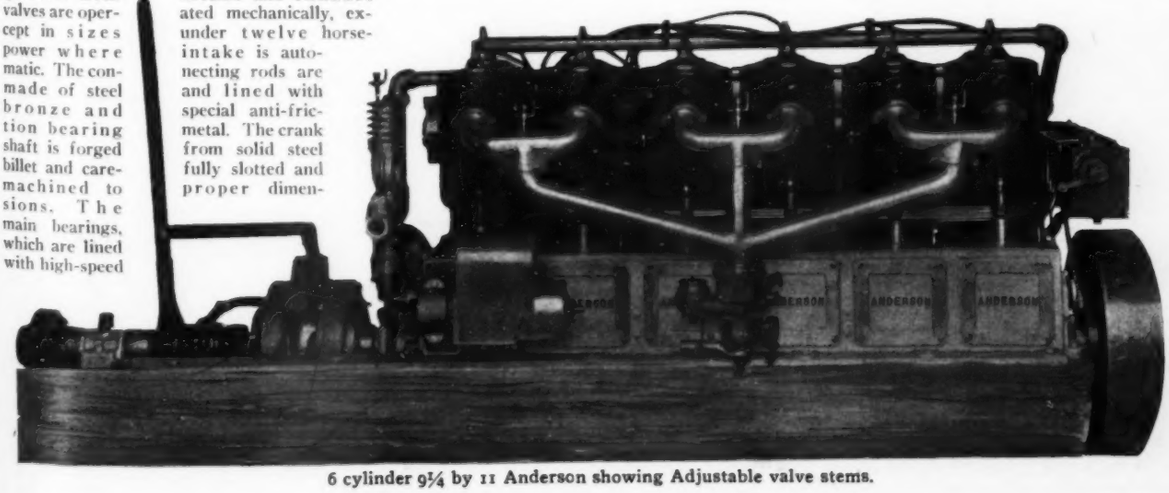
Anderson Engines.

A Medium Duty Motor Built in Sixteen Sizes from 2 h.p. to 150 h.p., Equipped with Magneto, High Tension Ignition and Force Feed Oilers.

THE Anderson Engine Company, with main office at No. 136 Dearborn Street, Chicago, Ill., are now offering their motors in sizes to adequately meet all requirements where a strong, medium-duty motor is required for either high-speed service or heavy work. The Anderson cylinders are made of a special mixture of close-grained iron, and cast with solid head so as to require no gaskets. Similar material is used for the pistons, making them light in weight but strong, and these are carefully ground and fitted. Tool steel is used for the piston pins, which are ground and tempered. The valves are made from steel forgings with extra large nickel steel heads and arranged on opposite sides of cylinders. Both intake and exhaust valves are operated mechanically, except in sizes under twelve horsepower where intake is automatic. The connecting rods are made of steel and lined with bronze and special anti-friction bearing metal. The crankshaft is forged from solid steel billet and carefully machined to fully slotted and proper dimensions. The main bearings, which are lined with high-speed anti-friction metal, are evenly distributed between each crank throw and are of ample size to insure long life at a minimum upkeep. Hardened tool steel is used for the cams and rollers, which are enclosed in the crank case, thus allowing the exterior of engine a very refined appearance. The cam shaft runs in removable bearings, which allow of easy adjustments.

Accessibility of the crank chamber is allowed by large-size hand-hole plates, arranged on both sides of the crank case. All Anderson engines are regularly fitted with Schebler carbureters and jump spark ignition. Baldridge reverse gears are used on all sizes between 10 and 50 h.p., and the Paragon on the larger sizes. The Anderson motors, up to 12 h.p., are furnished with Michigan reversible bronze propellers, and solid bronze Columbian wheels with this size and over. Oilers of the mechanical side-feed type are fitted to the larger sizes and start and stop automatically, thus insuring the minimum consumption of oil. Splash system and individual cups are used only on sizes under twelve horsepower. All Anderson engines represent the latest improvements in design and construction. Flexibility of operation, as well as thorough reliability, are their chief characteristics.

The reciprocating parts of Anderson engines have been carefully balanced to insure smooth operation, and long life.



6 cylinder 9¼ by 11 Anderson showing Adjustable valve stems.

New Things for Motor Boatmen

The Aerothrust.

The Aerothrust, which is intended for boat propulsion, consists of a high-speed three-port two-cycle engine developing four horsepower at 2,500 r.p.m., in combination with a specially-designed boat-aero propeller. The cylinder and crankcase of the engine are cast in one piece from a special alloy, which combines strength and lightness in a high degree. Ignition is jump spark with a vibrator coil, and the specially-designed carbureter is integral with the main motor casting. Lubrication is accomplished by mixing the oil and gasoline. The speed depends, of course, on the type of boat, but it is said that eight m.p.h. may easily be attained. The device is also adapted for ice boating or bicycling. The Aerothrust, complete, except propeller, costs $27.50. Propellers cost from $4.50, according to type. The makers are the Aerothrust Engine Company, of 815 Hearst Building, Chicago, Ill.

* * *

The Hitchcock Vapor Heater.

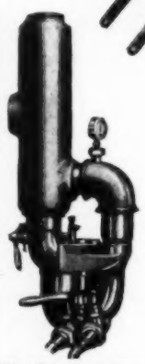
The Hitchcock vapor heater is a device used by the Hitchcock Gas Engine Company, of Bridgeport, Conn., on their engines to adapt them to the use of kerosene. The heated air is drawn from a special heater on the exhaust pipe, and is conducted to the vapor heater on intake pipe to which carbureter is attached. From there the heated air is drawn to carbureter, furnishing proper temperature to vaporize the fuel and is circulated in such manner as to maintain a constant temperature and prevents vaporized fuel condensing. A controller and thermostat are provided, by means of which the temperature can be controlled and kept at any desired point independent of the speed of the engine. The engine is started on gasoline, and in from 3 to 5 minutes the kerosene may be turned on.

* * *

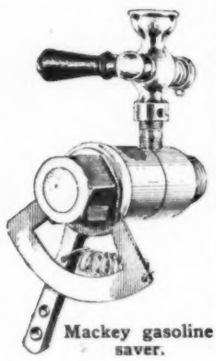
Economy Gas Vaporizer.

The Economy Gas Vaporizer, the essential parts of which consist of three fine gauze screens and a self-adjusting air intake valve, is easily and quickly installed without defacing the carbureter, manifold or motor. It is placed between the carbureter and the manifold intake pipe by means of connecting flanges. The vaporizer is designed to catch, in these screens, the flow of the mixture and break up the drops of the gasoline, thereby vaporizing the fuel and perfecting the mixture before it passes to the manifold. The mixture is kept from becoming too strong by the automatic air intake valve which feeds it the proper amount of air automatically while the engine is working, and closes when the engine is at rest. It is claimed that this vaporizer will reduce the gasoline bill to a very appreciable extent. It is made by the Economy Gas Vaporizer Company, of Adrian, Mich., and costs from $3.50, upwards, according to size.

The "Aerothrust."



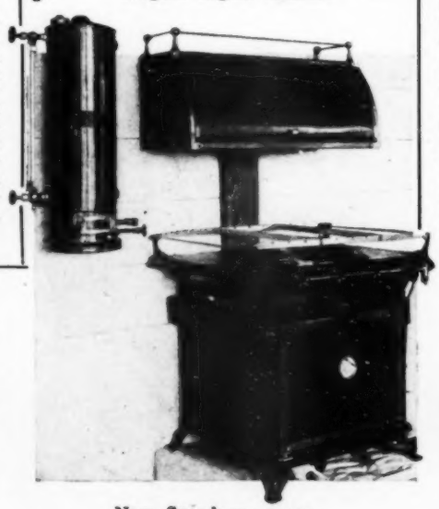
Hitchcock vapor heater.



Mackey gasoline saver.

The Doxameter.

Wagner engine cleaner.



New Speedway range.

A New Speedway Range.

The Gas Engine and Power Company and Charles L. Seabury Company, of Morris Heights, New York, have added a new and improved type to their line of Speedway alcohol ranges specially designed for motor boatmen. This is known as No. 2, and our illustration depicts it complete with oven, four-burner top, plate warmer and water-heater.

* * *

The Mackey Saver.

J. C. Mackey, of Syracuse, N. Y., has placed a device known as the Mackey gasoline saver and controller on the market. This is fitted in the intake manifold above the carbureter, and its functions are to break up the particles by means of introduced air and thus vaporize the mixture more effectually, and to clean out carbon deposits by the use of a little denatured alcohol. It is further claimed that the device effects a considerable saving in gasoline and insures additional power.

* * *

The Doxameter.

The Doxameter is a little device intended for installation on the intake manifold for the purpose of controlling the supply of fuel with the object of saving gasoline, increasing power and eliminating carbon troubles. The device is operated by being connected up to the ordinary accelerator pedal and it is claimed that its use not only saves a large percentage of gasoline, but insures perfect combustion of the fuel used. It is made by The Doxameter Company, of Chicago, Ill.

* * *

Wagner Engine Cleaner.

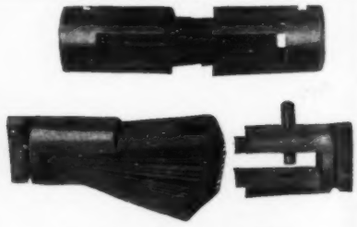
The Wagner Specialty Company, 18-20 West 63rd Street, New York City, sells the Wagner engine cleaner, which operates with kerosene projected by air pressure. It is claimed that a quart of kerosene, with the help of a 6-pound pressure of air, will clean all dirt, grit and grease from any engine; it also prevents wear and reduces the repair bills. This cleaner is quick, economical, thorough, easy and cleanly to operate, and is useful for repair shops.

* * *

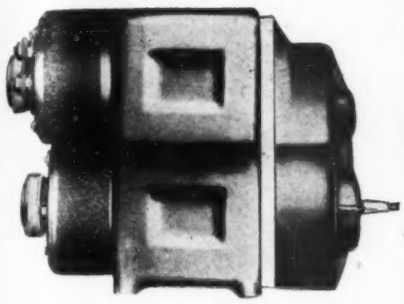
Francke Couplings.

The Smith-Serrell Co., Inc., of 90 West Street, New York City, are the general sales agents for the Francke flexible couplings. The general principles of this device are, in effect, the automatic counter-action of any divergence of shafts from their absolute center. This is attained by a series of tempered steel sleeves which are held at each end by a keeper pin, which, while preventing actual loss, controls the series and transforms them into a flexible coupling which is sensitive to any departure from alignment, and yet transmits the power. The device is suitable for all forms of power transmission and may be adapted for extremes of service, owing to the fact that the latitude allowed is sufficient to permit of each shaft or section running on its own bearing.

Economy gas vaporizer.

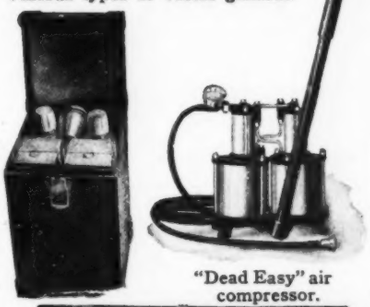


Francke flexible couplings.

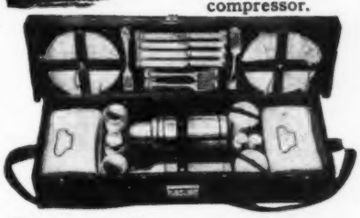


Combined motor, generator and reduction gear of Disco electric starter.

Various types of Victor gaskets.



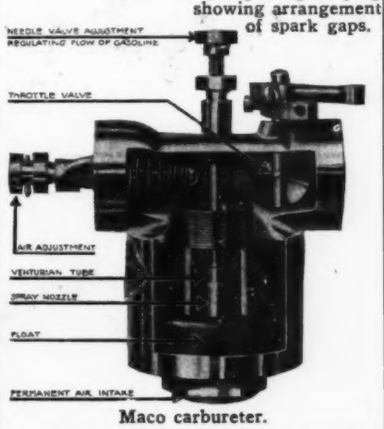
"Dead Easy" air compressor.



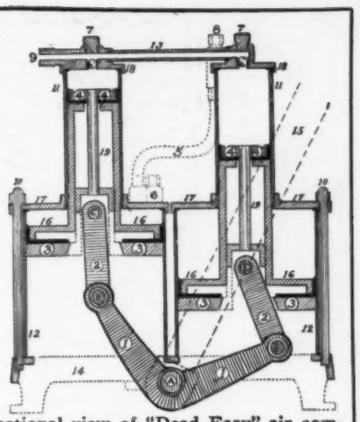
Thermos outfits for motor boatmen.

New V-Ray spark plug.

Triplex spark plug showing arrangement of spark gaps.



Maco carbureter.



Sectional view of "Dead Easy" air compressor.

Disco Electric Starter.

The new Disco electric starter is known as the double-decker, which comprises a combination motor and generator and reduction gear. There are two separate armatures, one generator and one starting motor. The total machine weighs about 70 pounds, and the generator drives at two to one with the engine crank shaft. The electric motor drives back to the engine crank shaft through the reduction gear at reductions varying from 11 to 1 to 30 to 1, in accordance with the requirements of the gasoline motor to which it is applied. The form of transmission used is spur gears, and on account of the small size of these gears, the machine is practically and commercially noiseless. Only one connection is required with the gasoline motor, making the machine adaptable and easy of installation. It requires no shift gears—the touch of a button operating the main switch for starting. The gears are constantly enmeshed all the time, but the electric motor is protected from running by a four-point roller clutch. The generator is of the shunt-wound type, large in its parts, but small and compact in its total size. It is not merely a lighting generator, but is made especially for the requirements of both starting and lighting, and produces sufficient current to take care of the requirements of starting, and to insure that the battery cannot become discharged. The Disco systems are made in both six and twelve volts, and are designed to turn a six-cylinder engine at approximately 150 r.p.m. The manufacturers are The Disco Company, Detroit, Mich.

* * *

A New V-Ray Mica-Lava Spark Plug.

Several important improvements have recently been made in the Mica-Lava Spark Plug. Foremost among these has been an improved process of imbedding the insulating mica in a solid block of bleached and glazed lava in such a manner that, while the lava furnishes absolute protection to the mica from the oil and heat of the motor, at the same time all pressure is removed from the lava as it is suspended independent of all strain. The entire compression is on the mica, which, of course, is non-breakable. The makers of this plug are the V-Ray Company, of Marshalltown, Iowa.

* * *

The Maco Carbureter.

In the Maco carbureter there are but two adjustments, the gasoline for low speeds and the auxiliary air for high speed, and these, once regulated, become permanent. The float chamber is radial and can be turned to any position to bring the gasoline connection to the side most convenient to the supply tank. The spray nozzle is directly in the center of the float chamber to insure constant fuel level in any position of the engine. The venturian tube in the constant air supply is so placed as to create a strong vacuum just above the point of the spray nozzle, and by also increasing the speed of the incoming air at this point, insures a good charge of gasoline and breaks it up into the finest possible spray. The needle valve adjustment is at the top. The makers are the Gleason-Peters Air Pump Co., of Brooklyn, N. Y., and the price ranges from $8 to $12.

The "Dead Easy" Air Compresser.

Although primarily designed as a tire pump, the compressor recently brought out by the Globe Manufacturing Co., of Battle Creek, Mich., is eminently suitable as an auxiliary hand-power pump for filling storage tanks. The pump consists of two pairs of cylinders of different diameters, secured to a base, and having two-stage pistons connected, by means of links, to a pivoted rocker arm, which is fitted with hand lever. The pistons are so arranged that continuous pressure is produced with a minimum of effort. The outfit, including gauge, costs $10.

* * *

Victor Gaskets.

Victor gaskets are made in a great variety of forms, and are intended for use in engine work of all kinds, special designs for cylinder heads, inlet and exhaust manifolds, intake and exhaust pipes, etc., being manufactured. Specially-treated Lake Superior copper and the highest grade of imported asbestos are exclusively used and all sizes are carried in stock. Victor sheet-packing gaskets for use where copper-asbestos is unsuitable are also specialized in by the Victor Mfg. & Gasket Co., of Chicago, Ill.

* * *

The Triplex Spark Plug.

The Charles R. Bates Co., of New York, are manufacturing a new spark plug which embodies several interesting features, the most important of which is the use of three distinct spark gaps, which are so designed that it is claimed the current must flow through all of them. Owing to the general arrangement of the gaps, it is said that an unusually intense spark or, rather, flash, is insured, with the result that ignition is positive and immediate, irrespective of the conditions or quality of the mixture. The cost of the plug is $1.50.

* * *

New Thermos Bottles.

The American Thermos Bottle Co., of New York, have introduced a new equipment especially designed for motor boatmen. This consists of a wooden case with reinforced corners covered with black patent cloth with padded cover and partitions. The interior of the case is divided in four sections holding two-quart Thermos bottles, two lunch boxes and a set of Thermocups. The shape allows the bottles to be carried in an upright position and the case is both water and dustproof. A strong lock is fitted and the equipment costs from $11.75 to $14.75, according to fittings specified—larger cases for four persons cost $47.

* * *

"Alumalux."

"Almalux" is a solder which is specially compounded and designed to unite aluminum to aluminum without the use of a blow torch. It is used with a soldering iron, and it is said that it will successfully solder a copper bottom to an aluminum pan. It is made by the Alumalux Company, of Sidney, Ohio, and costs $1.00 per bar with flux, or 35c per stick for flux only.

Yard & Shop

A New Pump.

The Trimount Rotary Power Co., of No. 152 Pearl Street, Boston, Mass., have recently placed a rotary hand bilge pump on the market, which has a pumping capacity of 20 gallons per minute. The makers state that they have equipped some of the leading boats of the season with this pump.

* * *

Raboco Built by Racine Boat Company.

The cruiser Raboco, which appeared on page 33 of the August issue, was designed and built by the Racine Boat Company, of Racine, Wis. Through an oversight, mention of this very important fact was omitted in the August issue.

* * *

New Catalogue.

The H. C. Doman Co., of Oshkosh, Wis., have recently got out a very attractive catalogue, describing their new line of engines.

* * *

New Type of Engine.

The Remington Oil Engine Co., of New York City, have recently placed a new type of internal combustion motor on the market, which is known as the Clark Commercial Oil Engine.

* * *

Interesting Speedway Engine.

A picture on page 45 shows a 6-cylinder 7" x 7" Speedway gasoline engine, 150 h.p. on test blocks. This is the type of engine used in Mr. Vincent Astor's "Corsava" and Mr. Hermann Oelrichs' "Cassandre," both being two-screw, and having two engines of this type.

Changes in Lamb Companies.

The Lamb Boat & Engine Co., formerly part of the J. D. Lamb Estate, has been bought outright by the Lamb Engine Co., a new organization that will continue the business along the same lines. The officers of the new company are as follows: President, M. J. J. Corkill, Chicago, Ill., who is also president of J. J. Corkill & Co., Bonds and Securities; vice-president, Mr. G. E. Lamb, Clinton, Iowa, who is also president of the Lamb-Fish Lumber Co.; treasurer, M. J. Corkill, Chicago, Ill.; secretary, Mr. E. C. Glenny, Chicago, Ill., who is secretary of the Fort Dearborn Trust and Savings Bank; general manager, Mr. F. B. King, Clinton, Iowa. It is the intention of the company to keep a large stock of motors in New York for quick delivery to the eastern trade with eastern offices at No. 50 Church Street, and with agencies in all the principal cities. They are working already on the new models for 1914, and will make a specialty of the larger sizes ranging from 60 to 180 h.p. The company controls valuable patents on air-starting and reversing engines, which will be used exclusively on Lamb motors of the larger sizes.

A kerosene fleet. The four boats shown herewith are all driven by Bridgeport kerosene engines.

The "Aimee M" and the "Choo Chee," both of which are powered with Sterling engines.

A Long Trip.

Capt. Matthias Johnson, of Perth Amboy, N. J., left Eastport, Maine, on August 3rd, for San Francisco, via the Panama Canal. He has letters from Mayor John P. Hutchinson, of Eastport, to Mayor Rolf, of San Francisco, and Governor Hiram Johnson, of California. The boat, which is 28 feet long, is of the whaleboat type, and is powered with a 3-h.p. Mianus engine, and fitted with auxiliary sails.

* * *

The Fellows II.

This interesting specimen of the semi-hydroplane type, of which we are showing a picture in this section, was designed and constructed by the Joe Fellows Yacht and Launch Company, of Los Angeles, Wilmington and San Diego, Cal. The length is 26 feet, beam 6 feet and the power plant a 70-h.p. Pope-Hartford, Portola model, turning a 16 x 26 Hyde propeller 1,700 revolutions per minute. Her speed is 33 miles per hour in the open sea. The hull is very heavy and the boat is used by Mr. Fellows both as a runabout and for towing when the shop boat happens to be busy. The hull has not been finished, as the boat is being used to experiment with. The results of the various tests being made will be incorporated this fall in a well-finished racer.

The keel of the Fellows II is absolutely straight, but the outer line of the hull at waterline amidships has a dip of about 6 inches lower than the keel, and then rises to a flat floor aft. The chain drive shown in our picture has been changed to a gear drive running in oil. The gears are one steel and one brass, 12 inches in diameter. They run at engine speed. The thrust is taken up by two thrust blocks, just where the shaft enters the hull and two universal joints are used between there and the gear box and again between the gear box and the engine. The hull is made extra heavy for open sea races, as Mr. Fellows holds all records for the race around Catalina Island, 80 miles in rough water. No challenge has been received this year for the Catalina race.

* * *

Two Sterling Boats.

We are showing in this section a picture of two boats, the Aimee M and the Choo Chee, both powered with Sterling engines. The former boat is a California cruiser built for open sea navigation in the Pacific Ocean. She is a 45-ft. x 11-ft. bridge deck cruiser, owned by R. Rochester, of Los Angeles, who uses it to run between his palatial summer home on Catalina Island, 25 miles out in the Pacific Ocean, and his office in Los Angeles. A speed of 13 miles is obtained with a six-cylinder 45-75-h.p. Sterling engine turning a 25 x 25

"Kalolah," a 70-foot cruiser, recently completed by the Gas Engine & Power Company, at Morris Heights, New York.

Hyde wheel. In the engine-room is located a 5-h.p. generating set, which provides current enough for a wireless outfit, as well as the customary electric lights. The storage batteries are of 400-ampere capacity, as Mr. Rochester insists on having plenty of light and has installed 28 eight-candlepower lamps. This splendid boat was designed and built by the Joe Fellows Yacht and Launch Company, Inc., of Los Angeles, who has a reputation for building fast and very seaworthy craft.

Choo Chee, a 26-foot runabout, designed and built by the Joe Fellows Yacht and Launch Company, of Los Angeles, for Mr. Rochester, to be used around his magnificent summer home on Catalina Island, Cal. With her four-cylinder 40-h.p. Sterling, Model B engine, she makes a speed of 20 m.p.h.

* * *

Bosch Triumph.

The Bosch Magneto Company, of New York, calls our attention to an interesting fact in regard to the recent Gold Cup races at the Thousand Islands. This fact is that not only the Gold Cup winner, but 100% of the boats to finish in the contest for this classic trophy, were equipped with both Bosch magnetos and Bosch spark plugs. They also mention that among the prominent boats taking part in the Perry Centennial contests, Kitty Hawk V, Kitty Hawk, Jr., Baby Reliance, Hazel II, and Speejacks were Bosch-equipped.

* * *

Leckler with Grossman.

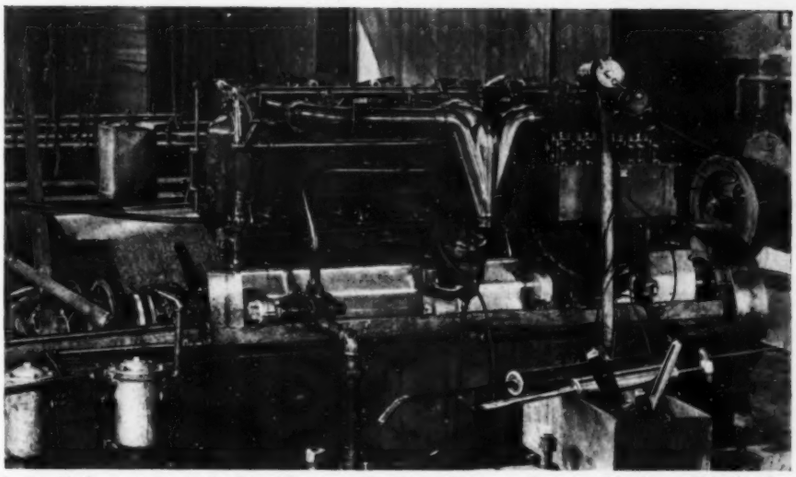
H. H. Leckler, formerly with the International Harvester Company, has joined the staff of the Emil Grossman Company in the capacity of mechanical engineer. Mr. Leckler was formerly in the engineering departments of the Winton Company and the F. B. Stearns Company.

* * *

Racine Contest.

The Racine Boat Company, of Racine, Wis., is inaugurating a very interesting contest. Six prizes are being offered for the best pictures of Racine boats, regardless of type and size. The prizes are divided into three sets — A, B and C, as follows:

Set A — The Best Side View. First Prize: Polished Brass Auto Phone Horn. Second Prize: Automatic Bilge Bailer.



A 6-cylinder 7 by 7-inch Speedway 150-H. P. engine on the test blocks. .This is the type of engine that is installed in Vincent Astor's "Corsaya" and Hermann Oelrichs' "Cassandre."

the club notes, is powered with a six-cylinder Loew Victor engine.

* * *

Detroit Exhibit at Kansas City.

Among the notable exhibits at the National Gas Engine Show in Kansas City, August 16 to 23, was that of the Detroit Lubricator Company. The exhibit consisted of a large stand, showing several Detroit Mechanical Force Feed Oilers driven by a small electric motor pumping oil against several hundred pounds pressure. These oilers were equipped with a glass front and an electric light was placed inside to illuminate the tank showing the mechanism operating exactly the same as in regular service. A large number of models of the Detroit Mechanical Force Feed Oiler were shown for use on stationary and marine gas engines, gas tractors, commercial trucks, automobiles and aeroplanes. This exhibit has been shown at several of the automobile and gas engine shows, and has never failed to attract a great deal of attention.

The "Flying Dutchman," a Borneo motor boat, which is equipped with an 8-H.P., two-cycle Caille Perfection gasoline motor.

Set B — The Best Bow View. First Prize: Polished Brass Auto Phone Horn. Second Prize: Automatic Bilge Bailer.

Set C — The Best Stern View. First Prize: Polished Brass Auto Phone Horn. Second Prize: Automatic Bilge Bailer.

* * *

Standard Catalogue.

The San Francisco Standard Gas Engine Company are putting out a very handsome catalogue, covering their line of engines, etc. An attractive cover in gray with a colored inset, decks the outside of the book, while the sixty pages within are taken up with full text descriptions and numerous illustrations. The typography and general get-up of the catalogue are very pleasing.

* * *

Loew Engine in Pocomoke.

The Loew Manufacturing Company, of Cleveland, Ohio, inform us that Pocomoke, which has been making a notable record in southern waters this summer, and whose winning at Oxford, Md., is noticed on page 34, among

Durkee Distributes Orswell Vibrator.

I. C. Orswell, whose name has been so long connected with the production of electrical specialties, and who has specialized in the improvement of waterproof ignition, has severed his connection with the Orswell Ignitor Company, of Boston, and is about to place on the market a newly-perfected ignitor, the distribution of which will be made through Charles D. Durkee & Co., of New York City. The past six months have been devoted by Mr. Orswell to making the most thorough tests of his new vibrators and plugs, under every conceivable set of conditions, and so confident is he of their quality, that they are to be sold on a money back guarantee, if they do not measure up to their advertised efficiency. A new system of wiring has also been evolved, which is simplicity itself. The appearance of these new devices will be awaited with interest by automobile and motor boat manufacturers.

* * *

Gasoline Yacht Kalolah.

The Gas Engine and Power Company, of Morris Heights, New York, has recently completed Kalolah, a 70-foot cruiser of attractive design and finish. The boat has a beam of 13 feet, a draft of 4 feet 3 inches, and a speed of 13 to 14 miles per hour.

The internal arrangements of this boat are carried out in a very satisfactory way. Her chain locker is forward, followed by a crew's toilet and then crew's quarters. This is followed by a stowage compartment, the engine-room and next the fuel tanks, great copper affairs holding 500 gallons of gasoline.

Directly aft of the fuel tank compartment, on the port side, is a stateroom, and on the starboard side is a passageway, separated from the stateroom by a curtain. Mahogany steps leading from this passageway to the deck. Next aft of the passageway is another stateroom, while on the port side, opposite the stateroom, is the bathroom, full equipped. Next aft is the owner's stateroom, extending the full width of the vessel. Portable steps provided for entrance from this stateroom to the deck. Wardrobe opening underneath the deck from this stateroom is provided. Next aft is the deck, with lazarette under, with entrance to same through a large brass deck-plate. In the after end of this deck is a grating seat, with copper air tubes under same, attached to the grating, so as to form a life raft. There is a deck-house, constructed of mahogany, which is used as a dining-saloon and social hall. In the after end of the deck-house the galley is arranged, provided with 4-hole Speedway al-

A 45-foot tug, built by W. R. Osborn at Croton-on-Hudson and powered with a 50-H.P. Wolverine. This boat is now in service on the Amazon River.

cohol range, etc. The crew's toilet, forecastle and engine-room are done in butternut, finished with three coats of varnish. All the joiner work in the owner's stateroom is in panelled mahogany. The rest of the owner's quarters, bath and passageway, is finished in white enamel, with mahogany trimmings. The deck-house is finished in mahogany, dark color, panelled.

The motive power consists of two 6-cylinder, 4-cycle, 6" x 6" Speedway gasoline marine engines of 50 to 60 h.p. each, of the latest design.

* * *

Sterling in Kathleen III.

The Sterling Engine Company informs us that Kathleen III, owned by G. E. Williamson, designed and built by the Hoffar-Motor Boat Company, recently won the P. T. P. B. A. cruising race from Olympia, Wash., to Victoria, B. C. The distance is 111 knots and the Kathleen's time of 11 hours and 22 minutes was excellent. The boat is a 65-foot cruiser with 12-foot beam and is powered with a 70-horsepower, heavy-duty Sterling engine.

* * *

A Kerosene Fleet.

We are showing in this section an interesting picture of a little fleet of four boats, powered with Bridgeport kerosene motors. These boats are all typical Cape Cod fishing boats, which are, of course, noted for their ability to withstand the most severe weather conditions.

One of these boats is owned by Captain Lewis, of South Wellfleet, Mass. Length 40 feet, beam 7 feet, and powered with a 10-h.p. two-cylinder, heavy-duty Bridgeport kerosene motor, which develops a speed of better than ten miles per hour. Captain Lewis uses this boat for fishing, and this fall will start South for the winter fishing.

The second boat is owned by Capt. A. S. Atwood, of South Wellfleet, Mass. Length 28 feet, beam 7 feet, and equipped with a 14-h.p. Bridgeport kerosene motor. This is the fastest boat of its size in Wellfleet Bay, with a speed of better than twelve miles per hour. The boat is used to gather seed for Captain Atwood's quahaug and clam beds, making a trip every low tide. The fuel cost per day on gasoline was $2.30, and with the Bridgeport kerosene motor, his total fuel expense for the same number of trips is $2.10 for two weeks' work.

The third boat is the property of S. S. Pearse, of South Wellfleet, Mass. Length 25 feet, beam 6 feet, and equipped with 14-h.p. Bridgeport kerosene motor of the jump-spark type. Mr. Pearse uses this boat in following his occupation of fishing and catching shell fish in season and the boat is in constant service.

The last of the little fleet is owned by Rapp-Huckins Company, of 47 Haverhill Street, Boston, Mass., eastern distributors for Bridgeport motors.

* * *

Producer Engines in New Field.

A fleet of large self-propelled barges, fifteen in number, to ply between New Orleans and the coal fields of Northern Alabama is of peculiar interest in that they are the first craft of their kind in America to be propelled by Producer gas engines. They are also the first craft to bring coal from the Alabama fields to New Orleans wharves by water. Alabama coal has heretofore been shipped to New Orleans by rail. A glance at a map of the Gulf States shows these barges follow almost as direct a route. Starting from the coal fields, they will proceed down the Black Warrior, Warrior and Tombigbee Rivers, across Mobile Bay and proceed to New Orleans by way of Mississippi Sound, Lake Borgne, Lake Borgne Canal and the Mississippi River, a total distance of a little over 500 miles.

The barges are of steel construction, and are similar in design to those in use on the canals of Holland. Their measurements are as follows: Length, 240 ft.; width on deck, 32 ft.; width at bottom, 28 ft.; depth, sides, 8 ft.; depth, center, 8½ ft. Their capacity is 1,000 tons. Draft, when fully loaded, 7 ft. They are propelled by twin screws driven by twin engines and have a speed of approximately 7 miles an hour when fully loaded. The weight of each barge and equipment is close to 240 tons.

Copyright by Baker Photo. Co.

The "Fellows II," a semi-hydroplane, designed and built by the Joe Fellows Company at Los Angeles. This boat has made a record of 33 miles per hour in the open sea.

Capt. Johnson in the open boat in which he is making the run from Eastport, Maine, to San Francisco. The boat is equipped with a 3-H.P. Mianus engine.

The screws are driven at 300 r.p.m. by two 75-h.p. Vertical Producer Gas Engines. Gas for the engine is furnished by a 150-h.p. Producer. The fuel used for the Producer is what has heretofore been a waste coke from the ovens of the Birmingham District and which, consequently, is secured at a very low price.

* * *

A Correction.

On page 39 of our August issue, it was stated that the Standard Motor Construction Company equipped its product with the Bosch magnetic make and break ignition. This was, of course, an error, as the Standard motor is equipped with the low-tension make and break ignition that has proved so entirely satisfactory.

* * *

Wonders to the Fore.

In the fourth of the 1913 series of handicap powerboat races for the McClurg trophy, the F. C. S. recently covered the twelve-mile course in 57 minutes from scratch. Frank C. Sherman is the owner and boat is equipped with a 2-cylinder 6-h.p. Wonder Engine. The time was 17 minutes faster than the course ever had been covered.

The summary:

BOAT AND OWNER	TIME	H'P
F. C. S., F. C. Sherman...	:57:00	scratch
Jess, John McKenna.....	1:47:10	41 min.
Stingaree, Carl Bull.....	1:29:45	23 min.
Sod Bug, Chas. Albert....	1:40:10	33 min.
Idle Hour, F. Eastwood...	1:31:00	23 min.

As a result of the race, the points to date are: F. C. S., 9; Jess, 5; Fox, 5; Bess, 2; Sod Bug, 2; Stingaree, 1.

While Florida's time for occupying the motor boating limelight has not quite yet arrived, the motor boatmen down there are, nevertheless, not idle. One of the most notable regattas of the summer season was recently held at Millville. The speed boat event here developed some particularly good sport.

The first prize was won by the Wonder, owned by Mr. J. A. Smith, of Millville, whose boat was propelled by a 15-horsepower engine and operated by Mr. Floyd Piffinger. The course was a five-mile triangular and the Wonder made the required two trips around this course in 28 minutes and 40 seconds.

The Wonder is 30 feet 2 inches in length, with a beam of 5 feet 6 inches and is equipped with a 15-horsepower Wonder engine, and her speed is estimated at 20 miles per hour.

The course was triangular and was a distance of three miles.

SEPTEMBER, 1913.

1st—Lake De Pue (Ill.), Riverside Boat Club. Speed and Handicap Races.
1st—Stone Harbor (N. J.), Y. C. Final races for Inquirer trophies.
1st—Annual Regatta Hudson River Yacht Racing Association. Haverstraw Bay.
2nd—California Section, American Power Boat Assn. Long distance race to Sacramento and return.
2nd-6th—Annual Regatta of the Motor Boat Club of Buffalo.
6th—Delaware River Y. R. A. Speedboat races for Record trophy.
6th—Hudson River Motor Boat Club. Open race to Poughkeepsie and return.
6th—Erie (Pa.), Y. C. Championship Race.
6th-7th—Pacific Motor Boat Club. Long Distance Race.
6th-7th—Chicago Motor Boat Club.
7th—Portland (Ore.), Motor Boat Club. Kalama, Wash. Race for Cruisers.
13th-14th—Chicago Motor Boat Club.
13th—Columbia Y. C. (Chicago), to Indian Harbor.
20th—Flat Rock Motor Boat Club. River carnival and club races. Going out of commission.
20th—Maryland Motor Boat Club.
20th—Delaware River Y. R. A. Farragut Sportsman's Assn. Speedboat races.
21st—Hudson River Motor Boat Club. Club races.
27th—Flat Rock Motor Boat Club.
27th-28th—Chicago Motor Boat Club. Annual Fall Regatta.
28th—Portland (Ore.), Motor Boat Club.
28th—New York Motor Boat Club. To Rockland Light and return.
29th-Oct. 4th—Perry Centennial Regatta, Louisville, Ky.

OCTOBER, 1913.

4th—Delaware River Y. R. A. Norristown (Pa.), Motor Boat Club. Race for speedboats.
11th—Columbia Yacht Club (Chicago), cruise down the Drainage Canal.
12th—Hudson River Motor Boat Club. Club run to Piermont, N. Y., and race to clubhouse.
12th—Portland (Ore.), Motor Boat Club. To Government Island.

MOTOR BOATING ADVERTISING INDEX

A

Aaron Automatic Bilge Pump Co. 70
American Engine Co. 88
American Life Saving Garment Co. 72
American Motor Parts Co. 93
American Steam Gauge & Valve Co. 70
American Thermos Bottle Co. 70
Amnelius, Theodore 68
Anderson Engine Co. 93
Anderson Spark Plug Co. 68
Apple Electric Co., The 72
Aristos Co., The 91
Acto-Pneumatic Swimming Belt, Inc. 70
Automatic Bilge Bailer Co. 68
Automatic Machine Co., The 67

B

Baldridge Gear Co., The 91
Bath Marine Construction Co. 93
Binney, Arthur 58
Boston Varnish Co. 70
Boucher Mfg. Co., H. E. 62
Bowes & Mower 58
Breazneli, Jos. H. 66
Bridgeport Bronze Marine Paint Co. 70
Bridgeport Motor Co., Inc. 73
Brooks Mfg. Co. 62
Brown-Collins Gas Engine Co. 62
Bruns, Kimball & Co., Inc. 58
Bryant & Berry Co. 91
Buermann, August 68
Buffalo Gasoiene Motor Co. 96
Byrne, Kingston & Co. 73

C

Caille Perfection Motor Co. 80
Camden Anchor-Rockland Mach. Co. 89
Campbell Co., A. S. 70
Campbell Motor Co., The 93
Canadian Fairbanks-Morse Co., Ltd. 72
Cape Cod Power Dory Co. 60
Carlisle & Finch Co. 94
Carlyle Johnson Mach. Co., The 80
Carpenter & Co., Geo. B. 89
Chelsea Clock Co. 62
Chicago Varnish Co. 60
Classified Advertisements 57
Cleveland Auto Boat Mfg. Co. 93
Coe (W. H.) Mfg. Co. 70
Columbian Brass Foundry 83
Cosmopolitan 88
Cox & Stevens 48-58
Cragg Motor Mfg. Co. 64
Craig, James 58
Crockett Co., The David B. 70
Curtiss Co., J. H. 92
Curtiss Aeroplane Co., The 77

D

Darrow Steel Boat Co. 66
Davis Boat Works Co., The 70
Dayton Electrical Mfg. Co. 68
Defoe Boat & Motor Works 60
DeLong Engine Co. 64
Detroit & Cleveland Navigation Co. 72
Detroit Lubricator Co. 89
Diem, Gus A. 70
Doman Co., H. C. 89
Driver-Harris Wire Co. 70
Durkee & Co., C. D. 91

E

Edison, Inc., Thomas A. 78
Elco-Bayonne (The Electric Launch Co.) ...2nd Cover
Eldredge (Albert E.) Corp. 88
Electric Goods Mfg. Co. 70
Electric Tachometer Co., The 88
Emmons Specialty Co. 66
Erd Motor Co. 77
Evans Stamping & Plating Co. 60
Evinrude Motor Co. 76

F

Fairbanks, Morse & Co. 62
Fairhaven Iron Foundry Co. 68
Fay & Bowen Engine Co. 78
Fellows Yacht & Launch Co. 58
Ferdinand & Co., L. W. 72
Ferro Machinery & Foundry Co. 81
Fiske Bros. Refining Co. 90
Fogg, M. W. 94
Ford, Gerald W. 54
Frisbie Motor Co. 57

G

Galusha, A. L., & Co. 60
Gardner, Wm., & Co. 50
Gas Engine & Power Co. and Chas. L. Seabury Co., Consolidated 56-75
Gasoline Engine Equipment Co. 62
General Electric Co. 72
Gielow & Orr 52
Gies Gear Co. 70
Gill & Sons Foundry Machine Works 76
Gillespie, Chas. H., & Sons 86
Gilmore Motor Mfg. Co. 64
Goblet-Dolan Mfg. Co. 62
Gray Motor Co. 65
Gray-Hawley Mfg. Co. 62
Gries Engine Co. 64
Grimm Mfg. Co. 64

H

Hacker, John L. 64
Hall Gas Engine Co. 72
Hall Co., W. S. 57
Hand, Wm. H., Jr. 58
Harbeck Motors Co. 62
Harper's Bazar 64
Harris (A. W.) Oil Co. 72
Hatch Oil Engine Co. 66
Hearst's Magazine 66
Henke Mfg. Co. 66
Henricks Novelty Co. 72
Herbert & Huesgen 72
Holmes Motor Co., Inc., The ...3rd Cover
Hopkins & Co., John C. 72
Howard Cruiser Works 66
Hyde Windlass Co. 85
Hydrex Silent Exhaust Works 62

I

Ideal Switch Co. 68

J

Janney, Steinmetz & Co. 86
Jencick Motor Co. 72
Jennings Yacht Agency 55
Jerolamon, Willard A. 62
John, William Edgar 58
Jones, Frank Bowne 53
Jones Co., S. M. 74
Jordan Bros. Lumber Co. 70

K

Kahlenberg Bros. 80
Kenyon Co., R. L. 60
Kermath Mfg. Co. 61
Koven & Bros., L. O. 62
Krice Carburetor Co. 94
Kroh Mfg. Co. 80
Kuhls, H. B. Fred 70

L

Lamb Engine Co. 96
Lawley, Geo. & Son, Corp. 62
Leary Gasolene Engine Co. 66
Lebby Engineering Co., The 80
Leece-Neville Co., The 81
Lisk, Geo. A. 66
Lockwood-Ash Motor Co. 83
Loew-Victor Mfg. Co., The 71
Luders Marine Construction Co. 64

M

McClellan Top & Hood Co. 62
McFarland Foundry & Machine Co. 83
McQuay-Norris Mfg. Co. 86
Marburg Bros., Inc. 68
Marine Compass Co. 62
Mathis Yacht Building Co. 84
Matthews Boat Co., The ...3rd Cover
Maximotor Makers 64
Mea Magneto 68
Mechanical Devices Co., Inc. 57
Mercury Motor Co. 84
Michigan Steel Boat Co. 66
Michigan Wheel Co. 84
Miller, Chas. E. 80
Milton Boat Works 76
Milwaukee Yacht & Boat Co. 84
Monarch Valve Co. 90
Monitor Boat & Engine Co. 64
Moore, J. B. 68
Morgan Mfg. Co. 93
Morris, B. N. 66
Morss Co., A. S. 92
Mosler (A. R.) & Co. 62
Motsinger Device Mfg. Co. 68
Mullins, W. H., Co. 64
Murphy Varnish Co. 68
Murray & Tregurtha 76

N

Narragansett Chemical Co. 72
National Gear Co. 70
Naval Architects & Yacht Brokers 58
New Departure Mfg. Co. 62
New York Gear Works 70
New York Yacht, Launch & Engine Co. 92
Niagara Motor Boat Co. 82
Niagara Motors & Mfg. Co., Inc. 85
Nicholson File Co. 62
Nock, Frederick S. 58

O

Oakes & Dow Co., The 82
Oshkosh Metal Products Co. 90

P

Packard Electric Co. 57
Page Engineering Co. 76
Palmer Bros. 64
Pearl Machine Co. 62
Peerless Engine Co. 93
Pickering & Co., H. B. 58
Pioneer Boat & Pattern Co. 94
Planhard Mfg. Co. 71
Pneumatic Mfg Co. 70
Poekel, T. S., & Co. 58
Pyrene Mfg. Co. 90

R

Racine Boat Co. (Racine) 82
Racine-Truscott-Shell Lake Boat Co. 62
Raymond Engineering Co. 66
Red Wing Motor Co. 76
Regal Gasoline Engine Co. 85
Reid Wheel Co. 70
Reliance Motor Boat Co. 70
Rice Bros. Co. 66
Richardson, G. R. 64
Robbins Co., L. D. 70
Roberts Motor Co. 79
Robertson Bros. 64
Roper & Co., C. F. 72
Rose Mfg. Co. 95

S

S. R. Mfg. Co. 62
Samson Cordage Works 95
Sands & Sons Co., A. B. 94
Scripps Motor Co. 95
Seaman, Stanley M. 49
Shaw Propeller Co. 86
Sherman, Eugene M. 60
Silvex Company, The 87
Smalley-General Co. 72
Smith & Co., Edward 70
Smith-Serrell Co., Inc. 94
Snow & Petrelli Mfg. Co. 95
Splitdorf Electric Co. 92
Standard Co., The 69
Standard Gas Engine Co. 83
Standard Motor Construction Co. ...2nd Cover
Standard Oil Co. 72
Stanley Co. 62
Star Bell Retainer Co., The 92
Stearns-McKay Mfg. Co 66
Sterling Engine Co. ...Back Cover
Sturtevant (B. F.) Co. 72

T

Tams, Lemoine & Crane 51
Thermex Silencer Works 60
Thomas & Co., W. E. 70
Thompson, Lawrence M. 58
Tiebout, W. & J. 70
Times Square Auto Co. 87
Toppan Boat Co. 72
Torrey Roller Bushing Works 75
Trimount Rotary Power Co. 92
Tuttle Motor Co. 64

U

U. S. Light & Heating Co., The 74
Universal Machine Co. 87
Universal Motor Boat Supply Co. 92
Universal Safety Mattress Co. 72

V

Valentine & Co. 59
Van Blerck Motor Co. 94
Vim Motor Co. 83
Viper Co., The, Ltd. 87
Vulcan Engine Works 62

W

Waterbury Welding Co. 92
Water Craft Co., The 72
Waterman Marine Motor Co. 85
Watkins Motor Co., The 72
Watts, J. Murray 58
Weckler Boat Co. 72
Wells, Theodore D. 58
Whitaker, Morris M. 58
Whittelsey & Whittelsey 58
Wicker-Kraft Co. 72
Wilcox, Crittenden & Co., Inc. 74
Willis Co., E. J. 94
Wilmarth & Morman 72
Winton Gas Engine & Mfg. Co. 63
Wisconsin Mach. & Mfg. Co. 76
Wolverine Lubricants Co. 70
Wolverine Motor Works 76
Wonder Mfg. Co. 72
World Today 66
Wright Engine Co., C. T. 93

Y

Yankee Co., The 60
Youngs, Wm. P., & Bros. 79

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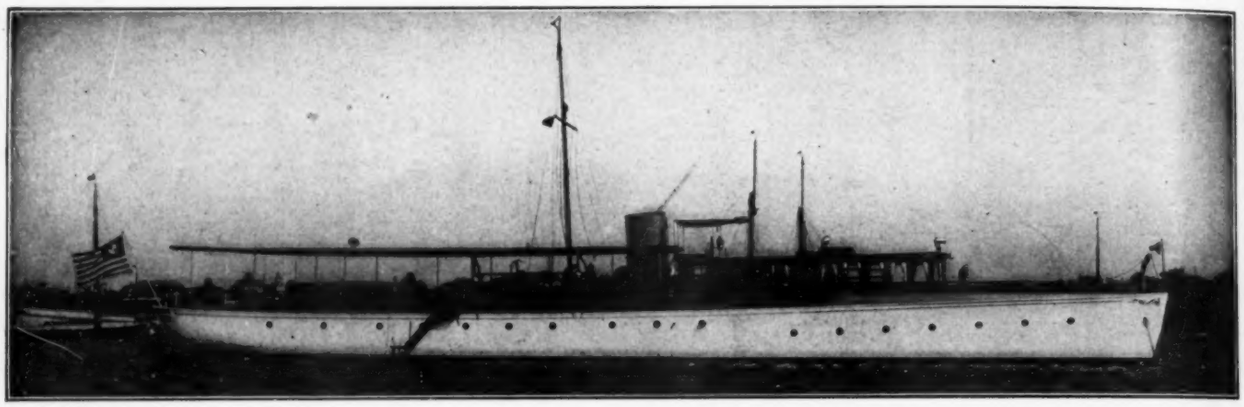
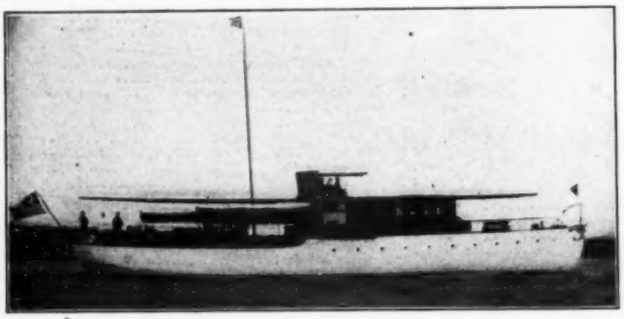
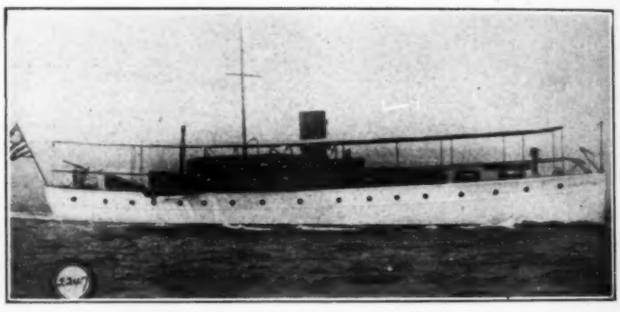


No. 885.—For Sale or Charter.—Exceptionally handsome, fast, steel, twin-screw cruising power yacht; 118 x 16.6 x 5 ft. Built 1910, from our design. Speed up to 18 miles; two 300 H. P. Craig motors, three double staterooms, main and dining saloons, two bathrooms, electric lights, etc.; handsomely finished and furnished. Probably the most desirable proposition ever offered in a large gasoline yacht. Apply to Cox & Stevens, 15 William St., New York.



No. 961.—For Sale.—Very seaworthy, twin-screw, cruising power yacht; 90 x 17 x 4 ft.; recently built by Lawley from our designs; speed 12-13 miles; two 60 H. P. Craig motors; large deck dining saloon, 3 staterooms, bath, two toilets; independent electric lighting plant, hot water heating system, etc. Price very attractive. Cox & Stevens, 15 William Street, New York.



No. 2247.—For Sale at Low Figure.—Practically new flush deck cruising power yacht; 90 x 15.3 x 4.9 ft. Speed 13-14 miles. Two 60-75 H. P., 6 cyl. motors. Three staterooms, main and dining saloons, bath, extra toilet rooms, electric lights, etc. Exceptionally able craft. Cox & Stevens, 15 William St., New York.

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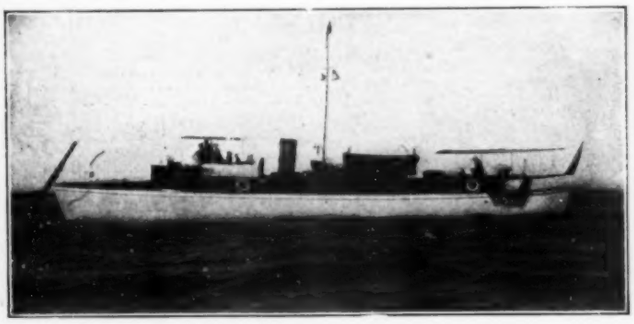

No. 442.—Sacrifice.—Cruising power yacht, 80 x 13 x 3.6 ft. In commission. Speed 13-15 miles; 100 H. P.; 6-cylinder; 20th Century motor (installed 1911). Two double staterooms, bath, dining saloon, etc. Cox & Stevens, 15 William Street, New York.

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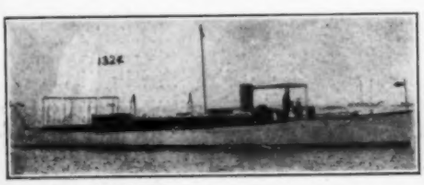
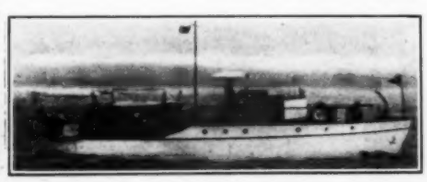


No. 1324.—Offer Wanted—70 x 11 x 3.10 ft. bridge deck power boat speed 13½ miles; 70 H. P. Craig motor; double stateroom, roomy saloon, etc. Excellent combined day boat and cruiser. Unusual opportunity. Cox & Stevens, 15 William St., New York.



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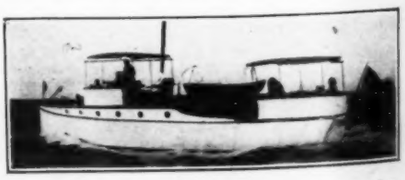

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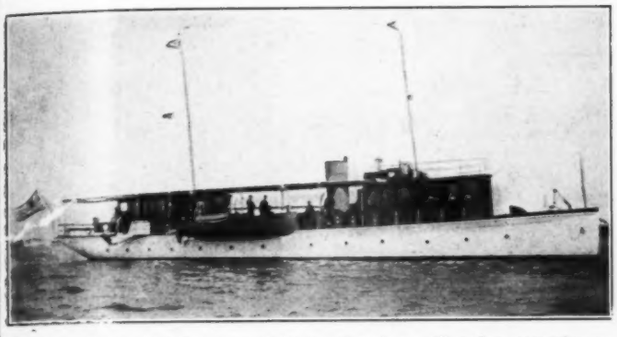
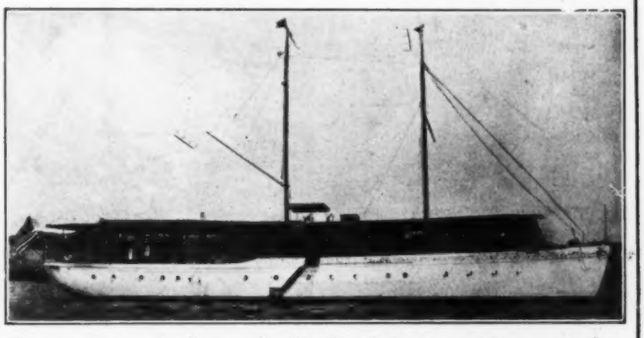


No. 6731.—98 o. a.; 6 staterooms; 2 baths; speed 13 knots; all modern conveniences; in commission. Cost $50,000; available at half price. Stanley M. Seaman, 220 Broadway, New York.



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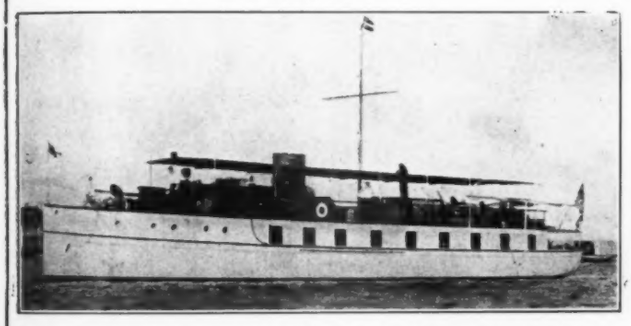
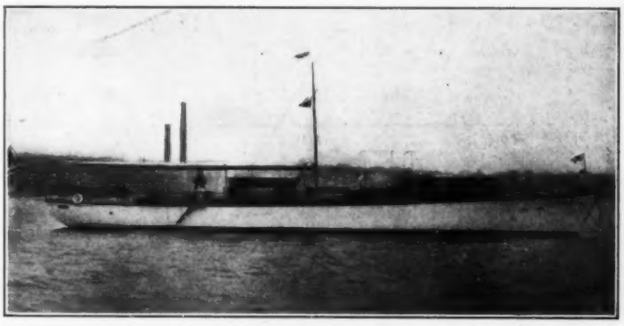


No. 7421.—90 o. a., 17 beam, 3.3 draught. Ideal American cruiser; 3 double staterooms; 2 baths; hot water heat; luxuriously appointed; cost $30,000. Very low price. Stanley M. Seaman, 220 Broadway, New York.



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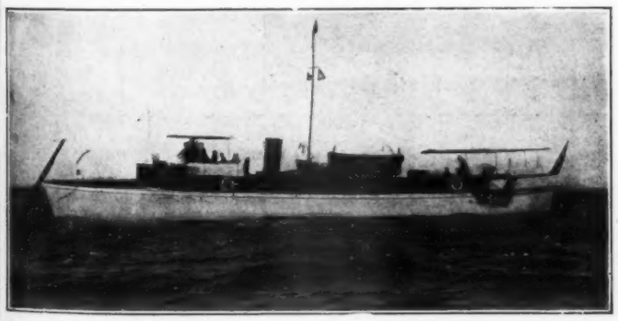

No. 5279.—80 o. a., 2 staterooms; bath; 100 h.p. 20th Century new 1911; speed 12 knots; in commission; perfect condition; complete. Exceptional bargain. Stanley M. Seaman, 220 Broadway, New York.

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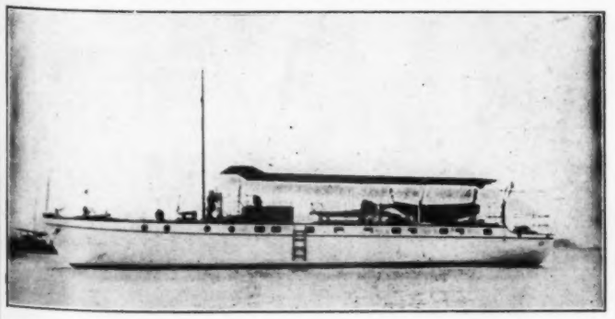

No. 7260.—68 ft.; 2 staterooms; large saloon; sleeps 8; bath; two 25 Standards; speed 12 miles; in commission. Stanley M. Seaman, 220 Broadway, New York.

No. 7428.—64 o. a., 17 beam, 3½ draught. Lawley construction; 4 staterooms; berths 9; 25 Standard; in perfect condition. Ideal for shoal waters. In commission. Stanley M. Seaman, 220 Broadway, New York.

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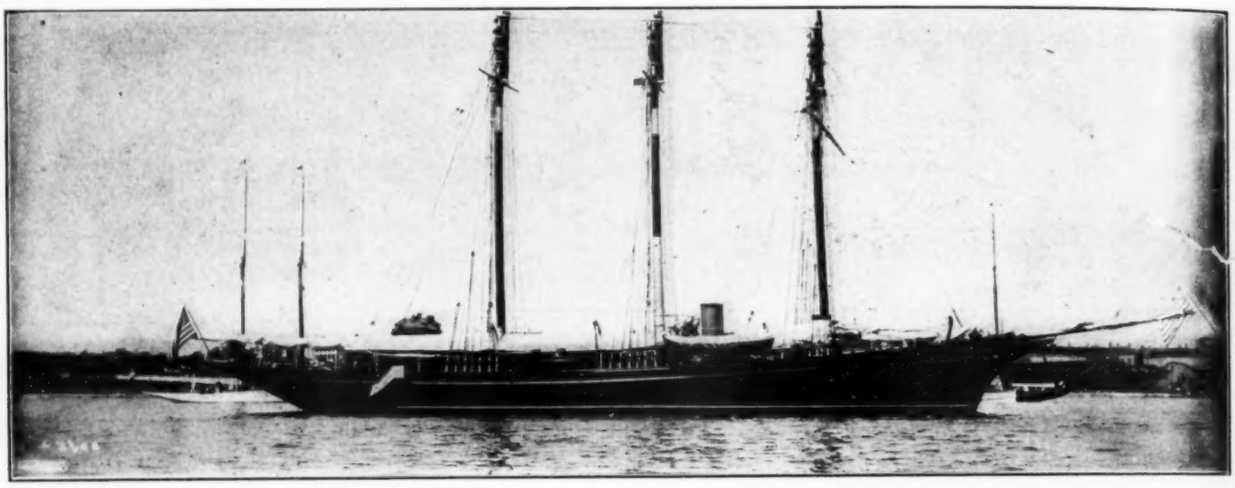
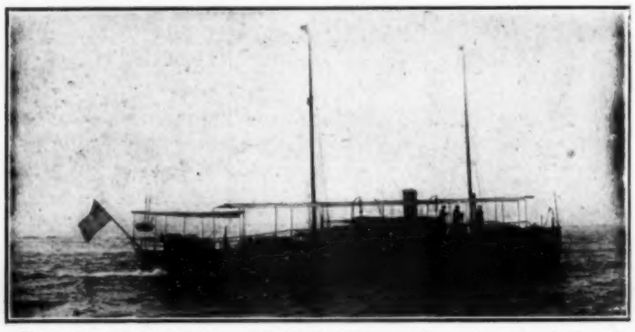
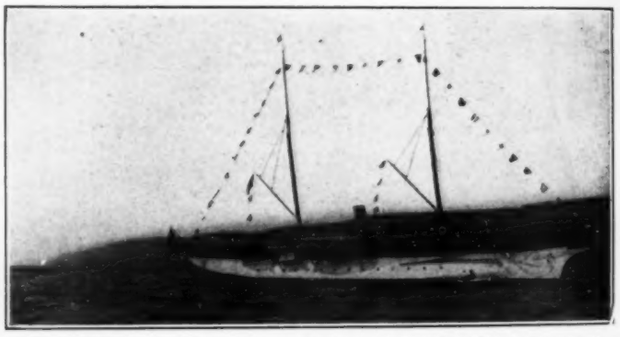


No. 638.—Steam auxiliary yacht, steel; 198 ft.; recent build; all modern appliances; ideal vessel for extensive cruising. Offered by an estate.

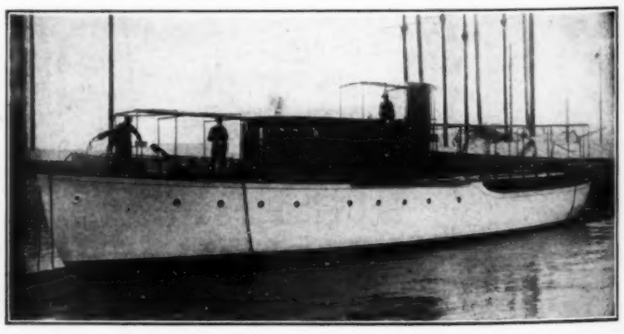


No. 1760.—Sale and Charter.—Flush deck, 85 ft. gasoline cruiser; Standard engine. *Please mention* MOTOR BOATING.

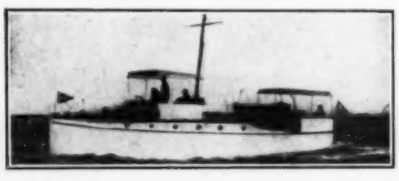


No. 1916.—Gasoline yacht; 130 ft. x 19 ft.; large six cylinder Standard motor; low figure.

No. 1506.—Steamer type, 73 ft. x 14 ft.; recent build; good sea-boat.



No. 1483.—For Sale.—Modern cruiser, 90 ft. x 83 ft. x 17 ft.; built by Lawley, 1909; commodious accommodations; two 60 H. P. motors. Adapted for Northern and Southern cruising.



No. 1904.—Raised deck cruiser, with forward bridge; 46 ft. x 10.6 ft.; built 1911; 25 H. P. motor. Attractive figure.

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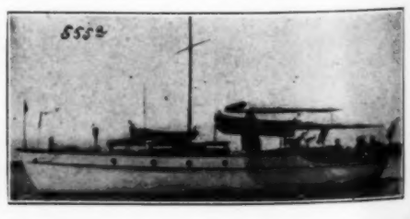

No. 942.—Desirable raised deck cruiser, 60 ft. x 12 ft.; attractive figure; 50 H. P. Standard motor.

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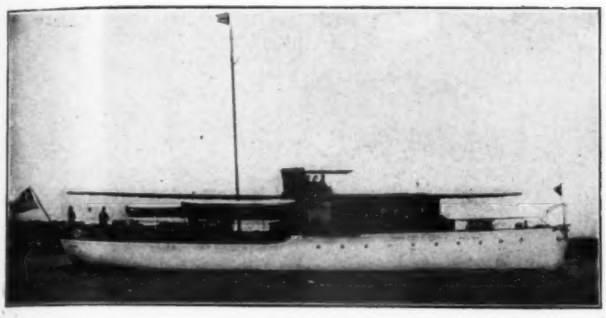
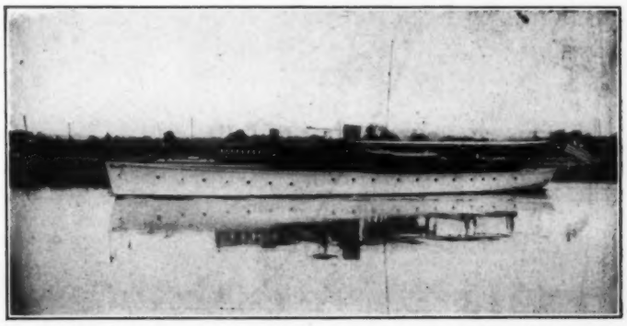


No. 7877.—For Sale—In commission.—Price attractive, modern raised deck cruiser, 90 ft. x 17 ft. x 3 ft. 6 in. draft. Built by Lawley, 1909; 2-60 H. P. Craig motors, saloon, three good size staterooms.



No. 7999.—For sale—Charter.—Fast twin screw gasolene cruiser; speed 20 miles; Craig motors.
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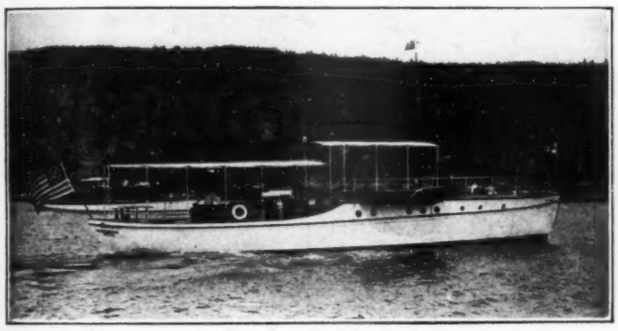

No. 7488.—For Sale.—65-ft. modern cruiser. Twin screw. Good quarters, including bath; ideal for Southern and Northern cruising; price attractive.
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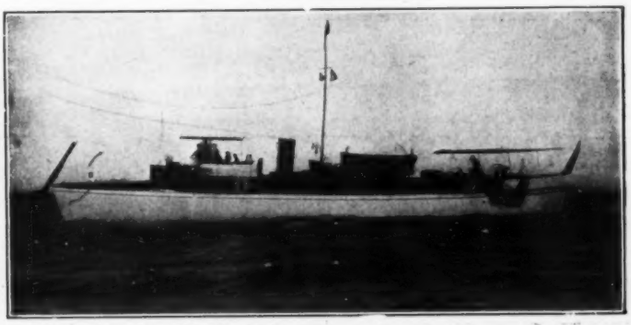

No. 7356.—For Sale—Charter.—80 ft. motor cruiser; 20th Century motor; speed 12 miles.
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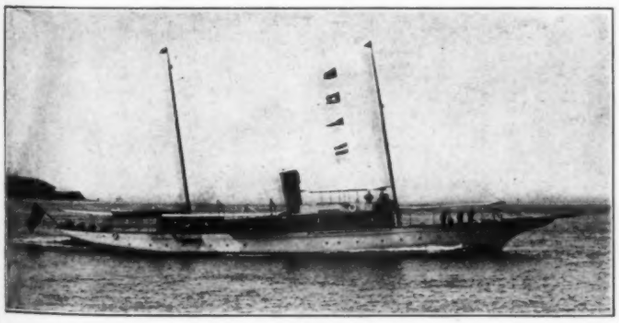

No. 18.—Sale or Charter.—Desirable 145 ft. steam yacht; attractively arranged; in excellent shape.
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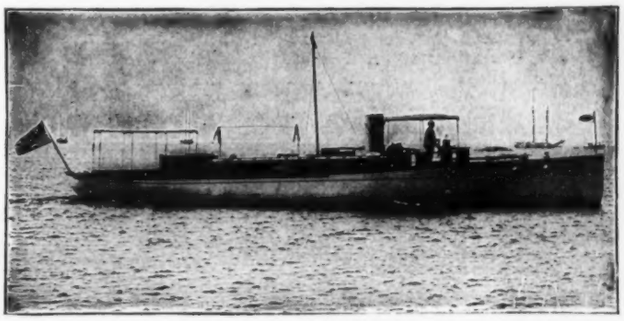

No. 7538.—Sale.—Bargain: 70 ft. raised deck cruiser built 1909; Craig motor; speed, 13½ miles.
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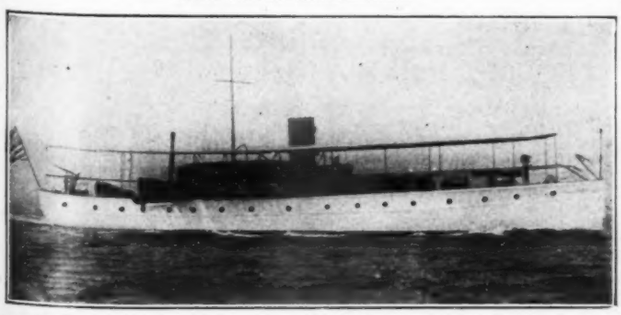

No. 8445.—For Sale.—At low figure practically new 90 ft. flush deck cruiser; 2-60/75; 6-cylinder motors; speed 13-14 miles; 3 staterooms, 2 saloons, bath, 2 W. Cs., electric light, etc.
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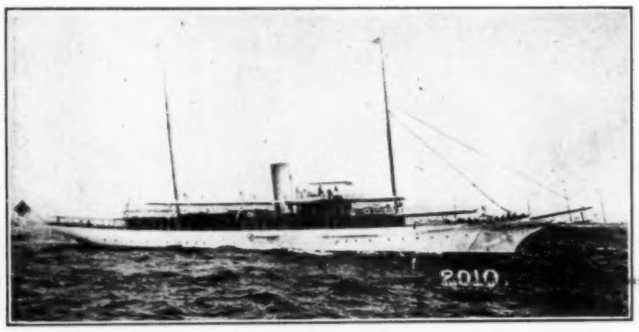

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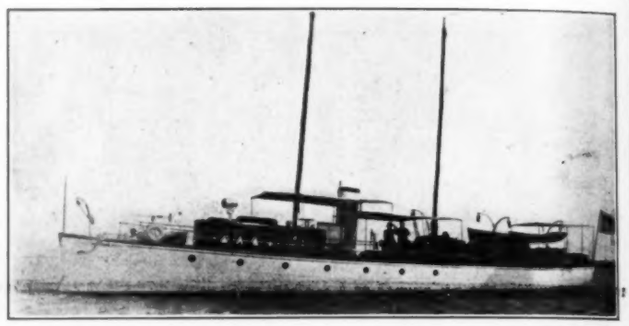

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No. 3488.—Auxiliary schooner, triple engine; Scotch boiler; 198 x 150 x 32.6 x 15 ft.; large accommodations; 10-12 knots; every convenience. Owned by an estate.

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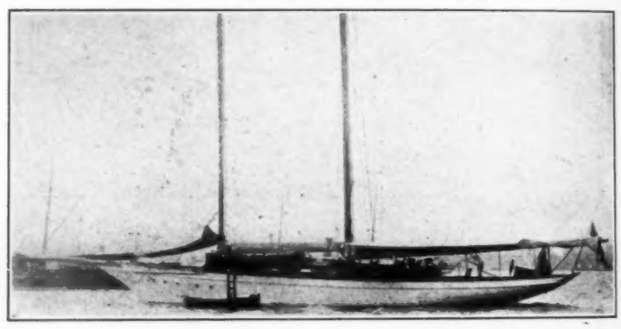
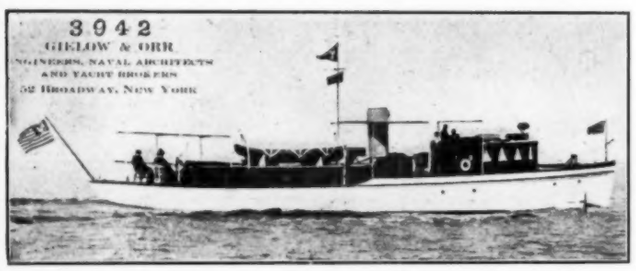


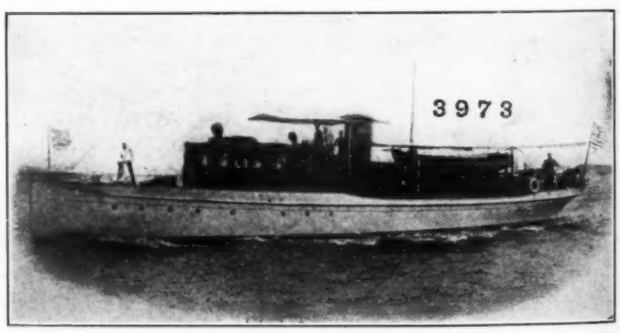
No. 2409.—Auxiliary schooner; 90 x 65 x 21 x 4.6 ft.; 100 H. P. 20th Century motor; copper sheathed on bottom; electric lights; excellent for service in any waters. Owned by an estate.

Please mention MOTOR BOATING.



No. 3942.—Twin screw; 78 x 14 x 3.6 ft. draught; copper sheathed on bottom; ideal for southern service; sleeps six in owner's party; two 6-cylinder Standard motors; electric lights. Low price.

Please mention MOTOR BOATING.



No. 3973.—Sale; twin screw; 82 ft. x 14 ft. 6 in. x 2 ft. 6 in.; built 1912; designed especially for shoal water conditions; every convenience; electric lights; two 6-cylinder Sterling motors. Reasonable.

Please mention MOTOR BOATING.

No. 4288.—Twin screw, modern houseboat; 77 x 18.6 x 2.6 ft.; built 1911; two 6-cylinder 20th Century motors; hot water heating plant; electric lights; fully found; unusual accommodations; all up-to-date features embodied; fine deck house speed 12 miles.

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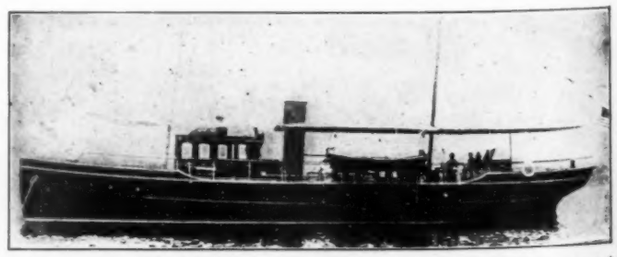

No. 3116.—Sacrifice; seagoing motor yacht; 74 x 14 x 4.8 ft.; strongly constructed; 85 H. P. motor; electric lights and heaters; refrigerating plant; 11-12 miles. Immediate delivery.

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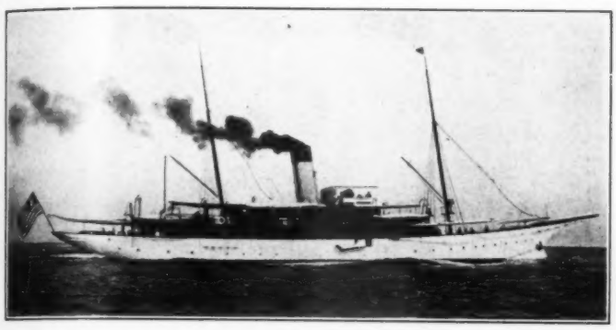
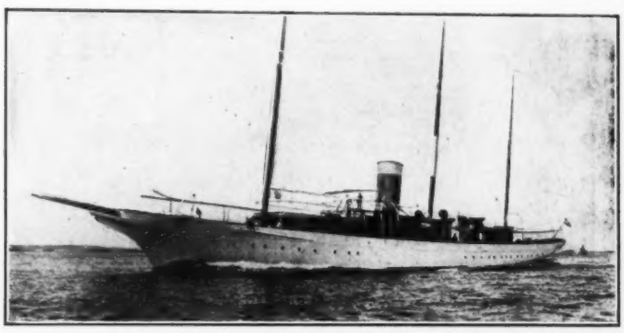
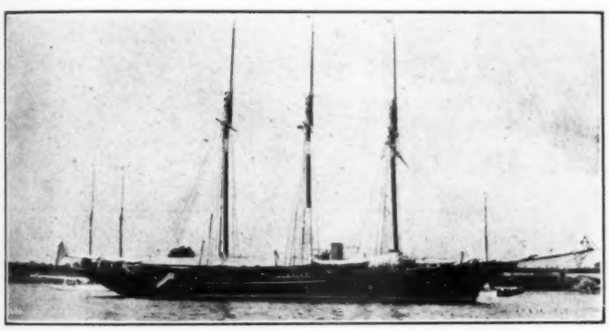


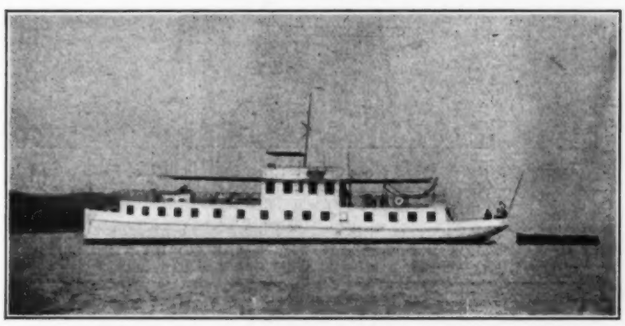
No. 3904.—200 ft. sea-going steam yacht. Accommodations aft. Reasonable price.
Please mention MOTOR BOATING.



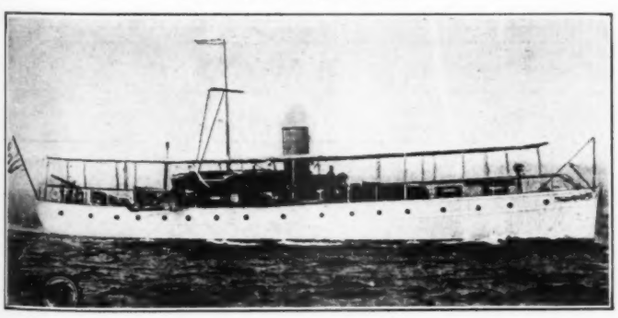
No. 49.—225 ft. steel steam yacht; the fastest of the large yachts; splendid condition; might be chartered.



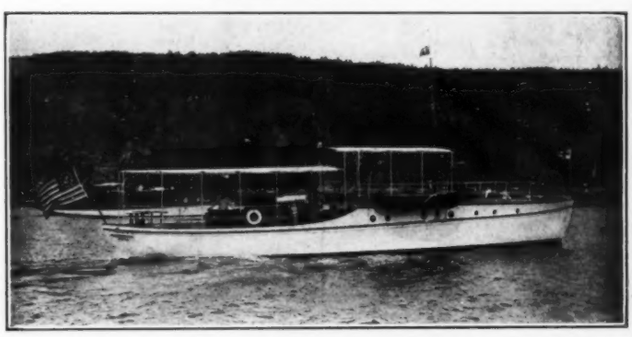
No. 5133.—Finest steam auxiliary afloat; good as new. Length 200 ft.
Please mention MOTOR BOATING.



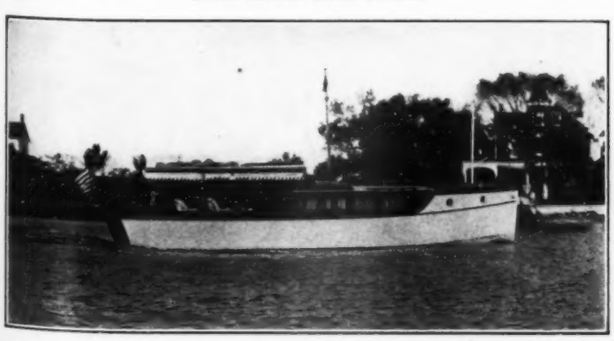
No. 5831.—110 ft. seagoing house yacht; speed 12 miles an hour; exceptionally accommodations. Sale or charter.
Please mention MOTOR BOATING.



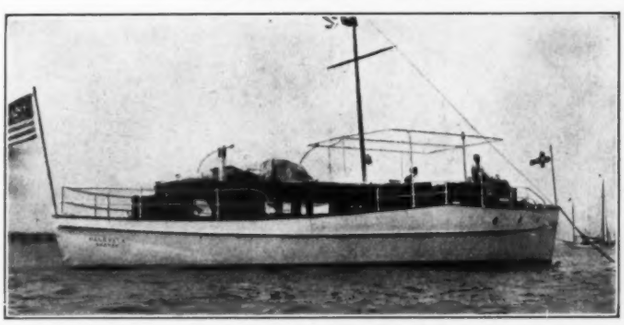
No. 2601.—90 ft. flush deck cruiser; twin screw. Has cruised to Cuba. Sale or charter.
Please mention MOTOR BOATING.



No. 4624.—65 ft. raised deck cruiser; good accommodations including bath; twin screw; suitable for southern waters.
Please mention MOTOR BOATING.



No. 6519.—36 ft. raised deck and trunk cabin gasoline cruiser; exceptionally good boat at a low price.
Please mention MOTOR BOATING.



No. 6288.—55 ft. gasoline cruiser. Good as new. Well-known heavy duty engine. Light draft.
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No. 557—Able 60 ft. cruiser; Standard motor; copper sheathed; desirable for Southern waters.

No. 327.—Gasoline yacht; 87 ft.; 150 H. P. Craig motor; 3 staterooms; in commission; Sacrifice.

No. 1—Auxiliary Steam schooner yacht; 200 ft. long; Lawley build; finest of type afloat.

No. 353—Twin-screw gasoline yacht; 90 ft. long; Seabury build; new 1911; Speedway motors.

No. 2—Splendid auxiliary steam yacht; 165 ft. long; in commission; classed 100 A1 Lloyds.

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No. 454—Desirable shoal draft; 87 ft. auxiliary ketch; Standard motor; just right for Southern waters.

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No. 272—Able 40 ft. raised deck cruiser; built 1912; in commission; fine order.

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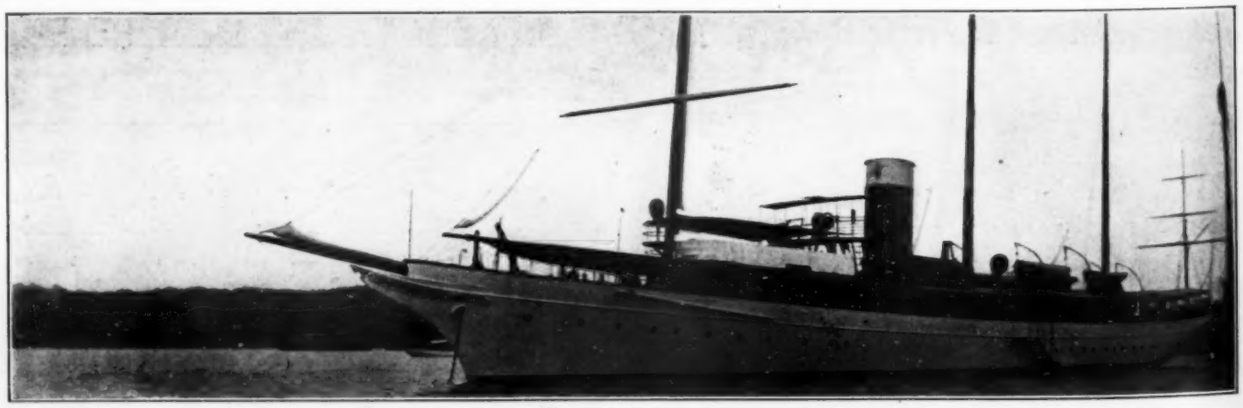
No. 157—Auxiliary yawl; 51 ft. long; in best order throughout. Very low price.

No. 401—Splendid auxiliary yawl; 4 cycle motor; saloon, stateroom, etc.; shoal draft; in commission.



No. 5—American built steam yacht; fastest of fleet; new boilers, etc. Finest of type on the market.
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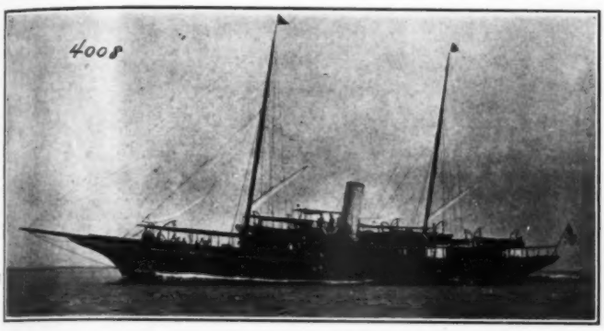
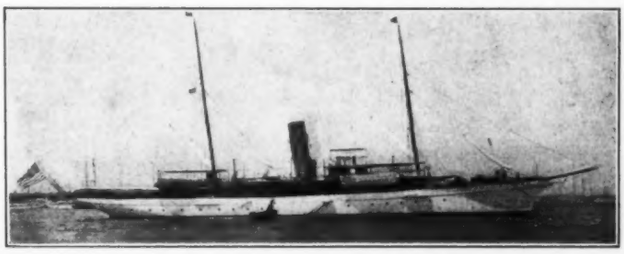
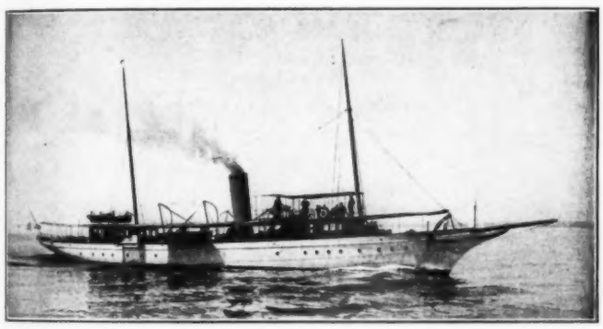


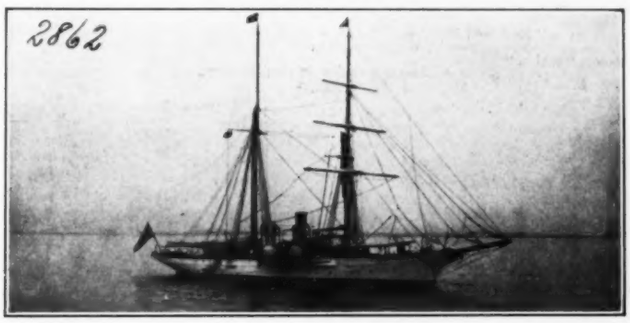
No. 4008.—200 ft. twin-screw, ocean-going, steam yacht; speed 16 knots; handsomely appointed; splendid accommodation.



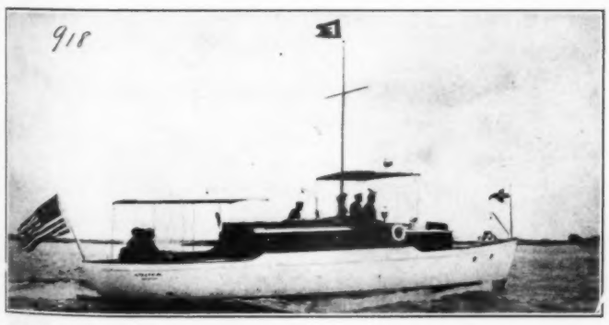
No. 3317.—Sale or Charter.—200 ft. ocean-going steam yacht; 10 staterooms; 4 baths. Exceptionally low figure.



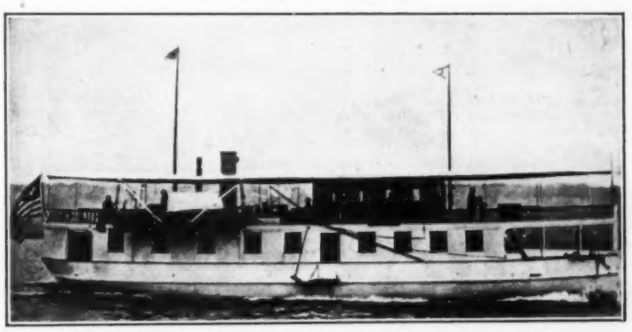
No. 3725.—180 ft. steam; splendid accommodation; perfect condition; speed 20 knots; price very attractive.



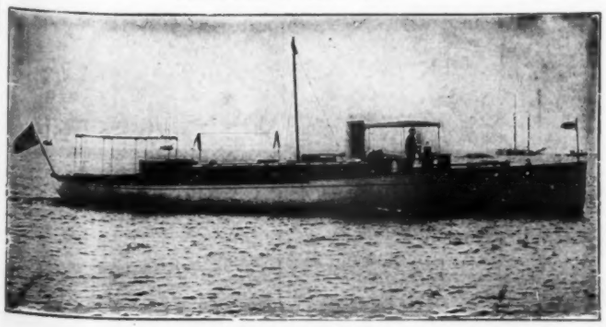
No. 2862.—Steam auxiliary; steel; 170 ft.; splendid accommodation. Ideal vessel for extensive cruising.



No. 918.—43 foot cruiser; saloon has four berths; forecastle two berths; two toilets; Standard motor. Speed 10 miles.



No. 3843.—Sale or Charter.—Twin screw house boat; 85 ft.; splendid accommodation; speed 10 miles. Price attractive.



No. 1197.—70 ft. gasoline cruiser. Speed 13 miles. Price low.

No. 1253.—Twin screw gasoline cruiser; 65 ft. x 14 ft. x 4 ft.; pilot house, saloon and stateroom, sleep six; three toilets. Speed 11½ miles.

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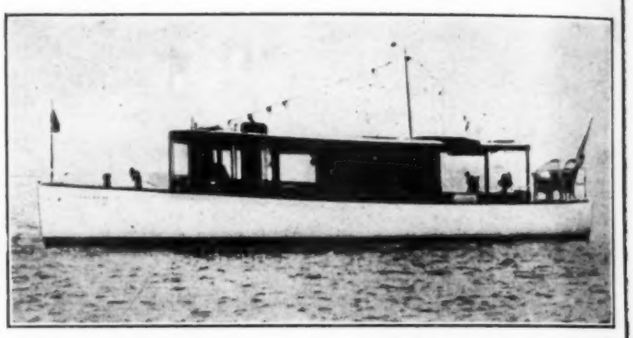
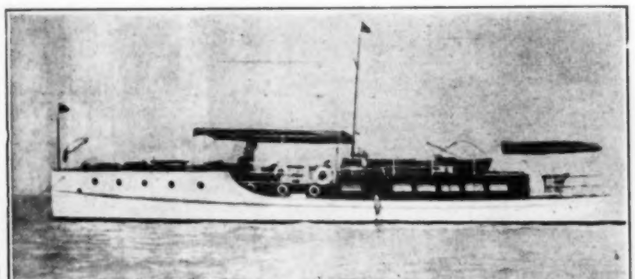


C-102.—Glass Cabin Day Cruiser. 40 x 8 x 2 ft.; designed and built by us in 1910; Speedway 4 cylinder, 32-40 H. P.; speed 12-13 miles.

Please mention MOTOR BOATING.



C-107.—Raised deck cruiser, 70 x 11 ft. 5 in. x 3 ft. 6 in. Designed and built by the Matthews Boat Co. in 1906. New "Speedway" 100 H. P. installed in 1909. Fully found.

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C-104.—Hunting Cabin Day Cruiser. 50 x 6 ft. 6 in. x 3 ft.; designed and built by us June, 1908; Speedway 6 cylinder 100 H. P.; Speed 22 miles; delivered in excellent condition.

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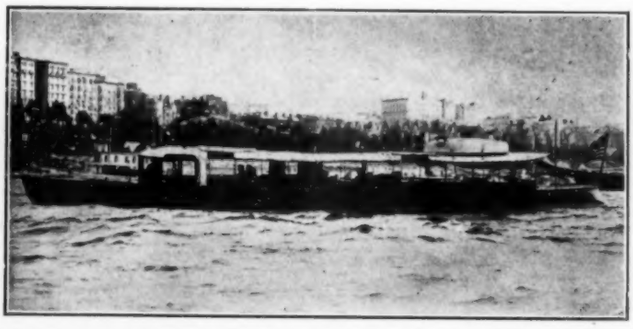

C-105.—High Speed Day Cruising Steam Launch. 65 x 8 ft. 4 in. x 3 ft.; designed and built by us in 1902; used three seasons; Seabury 9 in. stroke triple plant and Seabury water tube boiler; speed 21-22 miles.

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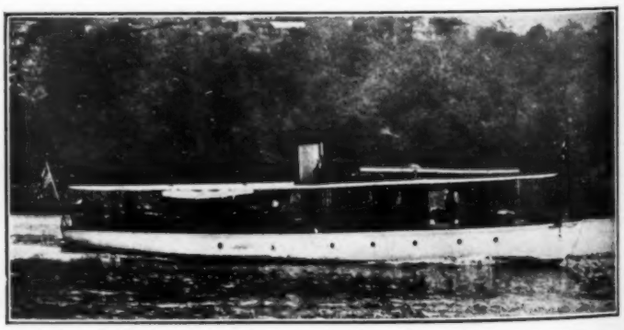

C-106.—Steam Cruising Yacht. 85 x 12 x 4 ft. 6 in.; designed and built by us in 1902. Seabury 10 in. stroke triple plant and Seabury water tube boiler; speed 15 miles.

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FOR CHARTER—By day or week, cruiser "Lily"; 30 x 8; completely equipped; electric lights, lavatory, galley, icebox, etc. Otto Thomas, 324 East 89th St., New York City. 'Phone Lenox 5123.

WANTED—Experienced boat builder to assist in developing line of small power boats, steady employment for right man. State experience, wages wanted, etc. Address X, c/o Motor Boating.

CYLINDERS REBORED—Pistons and rings fitted, new cranks, connecting rods, cases, transmissions, any part for automobile or motor boat motor reproduced like original. The shop of quality. McCadden Machine Works, Minneapolis, Minn.

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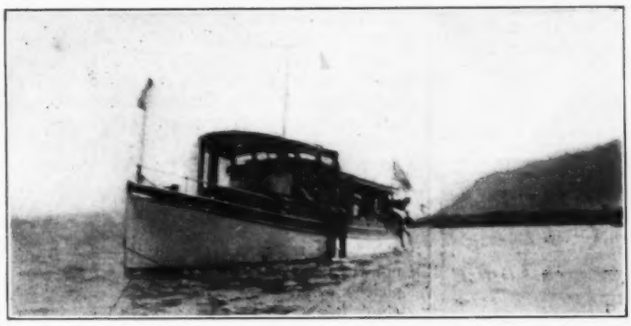

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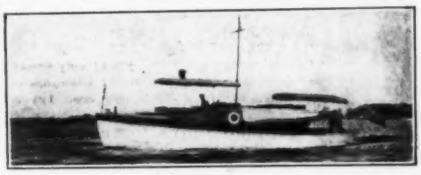

Bridge deck cruiser, 37 ft. 5 in. by 9 ft. 1 in.; 24 H. P. Lamb motor. Boat less than two years old, and cost new over $4,000. For quick sale will sacrifice for $2,000. For particulars address Sacrifice, care of Motor Boating.

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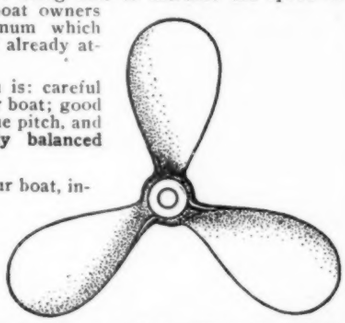

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A Process of Elimination.

(*Continued from page 31*)

right). Two primary coils and independent circuits may be necessary.

With the jump spark system where multiple coils and vibrators are used look for a "slow" vibrator in the unit for the cylinder at fault. Such a "lag" may cause several degrees difference in the timing. Slack the vibrator spring a little, or try a new unit. A master vibrator is usually better for more than three cylinders. A dirty or worn timer often causes irregular timing. Persistent preignition may pull a cylinder up or down depending upon the timing of the others. Remedy: remove the cause, generally a heavy carbon deposit or poor water circulation. If the ignition is all right look for valve troubles in the four cycle. With automatic intake valves the spring may be either too stiff or not enough so; compare the one on the suspicious cylinder with the others. The cams (both inlet and exhaust) may be badly worn or the valve stems may be hammered up so that the lift is insufficient. Sometimes an inlet valve system or its guide will be so badly worn as to allow considerable air to be drawn in, thus making too lean a mixture.

With the two cycle when everything else appears all right the deflector plate on the piston may be found on the wrong side. Poor compression from any cause will, of course, decrease the power output of a cylinder. Look carefully to the crankcase compression of a two-cycle motor.

M. S. BROWN, Pacific Grove, Cal.

The A. P. B. A. Gold Challenge Cup Goes to Lake George.

(*Continued from page 9*)

ponent of the race for a half hour in the expectation that the wind would die down towards sunset. Conditions were a trifle better at 5 o'clock when the judges decided to send the boats away.

The delay was a costly one to Graham Miles and P. D. Q. III. After jockeying about and learning that a half hour must elapse before the race would be called P. D. Q. III was run back into the Boldt's yacht house. When 5 o'clock was reached the engines failed to respond as the men worked over them with feverish energy.

Eight minutes later the P. D. Q. swung from behind Isle Imperial and shot away. The others were miles away. Far down the course the shaft in Mitt III had snapped under the strain and the crippled boat, defender of the cup, was no longer a factor. The race became a procession, Little Joker by her splendid performance taking second rank in the spectators' interest. Ankle Deep romped home a winner in 47 minutes, 29 seconds, about two and a half minutes slower than on the first day.

The third day's racing saw a smaller crowd of spectators, yet the interest in the outcome was well sustained to the very last. The Weather Man smiled over the course. There was no postponement on account of choppy seas. The race became a battle royal between P. D. Q. III and Little Joker. At the turns the Little Joker managed to cut closer to the buoys and gained yards by the maneuver, though, on the straightaway the P. D. Q. gained what she had lost. Ankle Deep had forged ahead at the start and led to the end.

Next year will witness a supreme effort on the part of the Thousand Island Yacht Club to regain possession of the trophy. Not only will the club be interested, but every person at the Islands will add his prayers that the cup may again grace some one of the associations between Clayton and Chippewa Bay. Fifty thousand dollars will be available, it is said, to the man who can build the boat that, flying the flag of a Thousand Island club, will bring back the cup. Graham Miles, son-in-law of George C. Boldt, and a most enthusiastic racer, will undoubtedly remain in the game for a few years to come and much will be expected of him next year at Lake George.

Using the Lead.

(*Continued from page 11*)

13 fathoms from the lead—a blue woolen rag.
15 fathoms from the lead—the same as five fathoms.
17 fathoms from the lead—the same as seven fathoms.
20 fathoms from the lead—two knots.

This is as long a line as the average motor boatman has need of, and, in fact, is much longer than he would generally use in determining the depth of water to prevent grounding. For this purpose, it is a good plan to mark the line in feet for a depth a little beyond the draft of the boat so that more accurate readings may be obtained.

Get a lead and line and mark it as above. It will be a source of satisfaction, if nothing more, to have it aboard and to know that it is ship shape; and it will be more than that if you are to do any real cruising.

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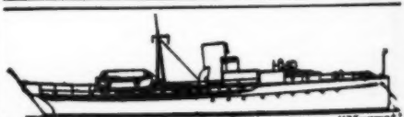

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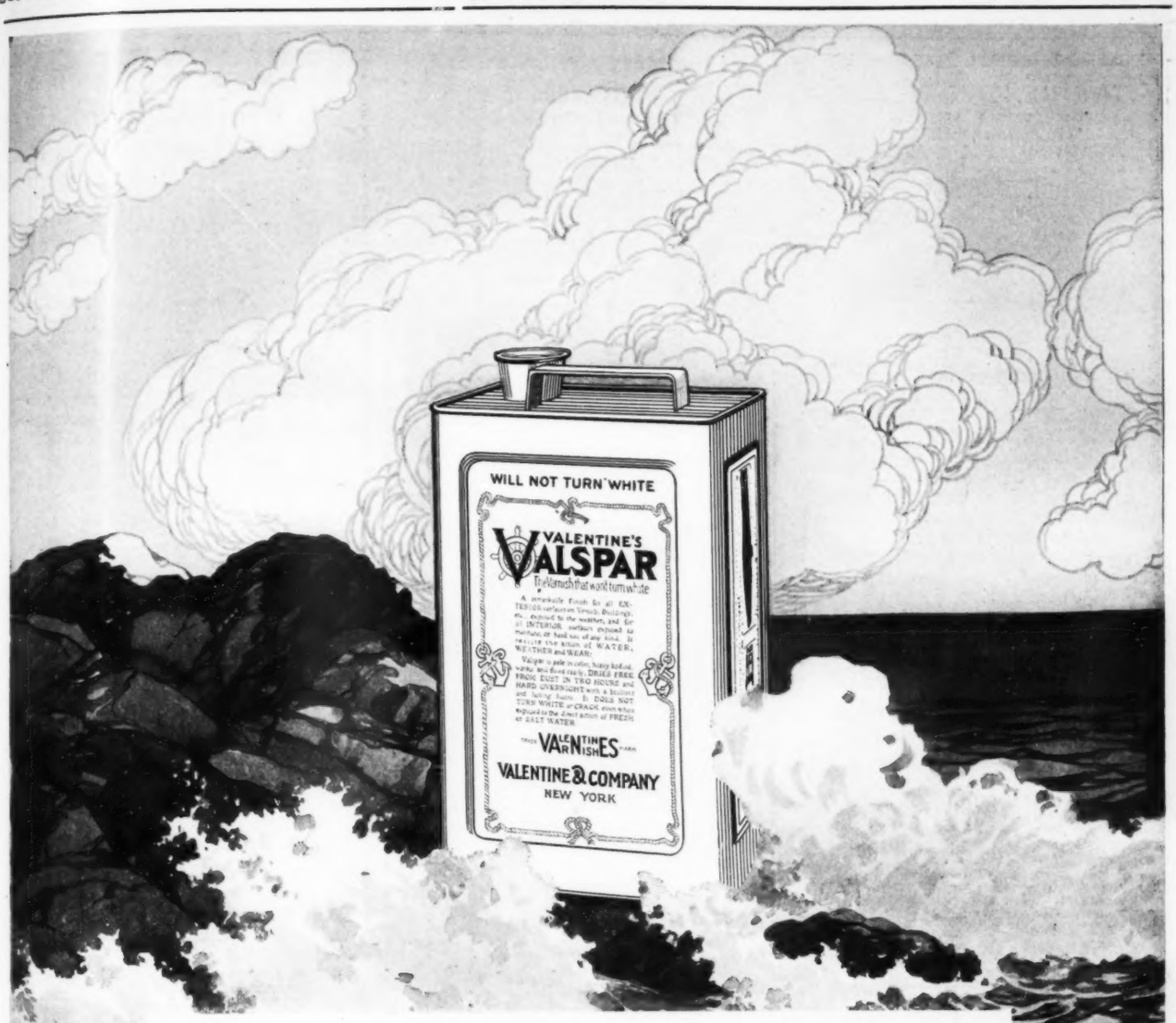

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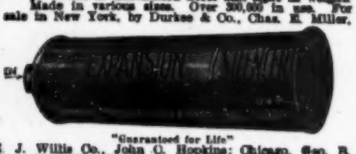

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The Perry Centennial Races.

(*Continued from page 5*)

destination not one of the boats which only had to travel an hour's run from home would meet them. The same holds true throughout the week in regard to these two boats, especially Peter Pan V as they entered every race in which they were eligible and in general gave a good account of themselves.

The class for the National Championship Trophy was won by Chinook in a walkover and the class for Interstate Trophy brought out only six starters, of which only four finished. Last year's races at Yonkers, N. Y., brought out ten starters for this same trophy. The speed, however, was better this year—Cinderella made the best speed, 27.6 miles per hour, while last year the best speed was only 25.2 miles per hour. Red Devil, owned by O. P. Demars, powered with a 40 H. P. Loew Victor Motor carried off first honors on corrected time with Cinderella, only one point behind her. (A complete summary of these events is given on page 36.)

Tuesday's races were of the highest order, worth going thousands of miles to see and a great credit to the persons who had charge of the preliminary arrangements in getting the boats together. It had originally been intended to run the two classes—one for twenty-footers and the other for twenty-six footers, in three heats each and award the prizes on the point system, but the great aversion of the Westerners to this scheme caused the committee to call off the heat system and make each heat a race in itself, dividing up the prize money, so that for the 26-foot class, $125 went to the winner, $75 to second, and $50 to third. For the 20-foot class each prize was $25 less. All of the races except the final event of the day—the Perry Centennial Free-For-All were ten miles in length—five miles up the river and five back.

In the first event of the day for 20-footers, five hydroplanes started, finishing in the following order, Hazel II, Kitty Hawk, Jr., Peter Pan V, Scat. Whiz, Jr., started but failed to finish. The time made by the boats in this first race was an indication of what we were to expect in the line of racing for the day. Hazel II did the ten mile course in 13 minutes, 52 seconds, which is at the rate of 43.2 statute miles an hour, and Kitty Hawk, Jr., showed 42.6 miles. The winner is an Elco-plane built by Elco-Bayonne and is owned by A. E. Smith, of New York City. She is powered with two Curtis aeroplane engines of 106 H. P. each, connected in tandem to one propeller shaft. Kitty Hawk, Jr., is a Hacker design, 20 feet in length, owned by H. H. Timken. She is powered with a 6-cylinder, 125 H. P. Van Blerck motor and uses a genuine Harthorn propeller. Her performance is very remarkable considering her low power.

The second race for the day was for 20-footers and only Peter Pan V and Kitty Hawk, Jr., showed up at the starting line. The latter came out the victor, winning rather easily with a speed of 42.1 miles per hour as Peter Pan V had run over a mud flat earlier in the day and badly bent her propeller.

When the 26-foot class was called at 1:30 in the afternoon the same boats lined up as appeared in the morning race for this class, with the exception of Baby Reliance III that replaced Peter Pan V, which was hauled out to straighten her wheel. Again Hazel II, the Elco-plane, proved the winner, this time beating her previous record by 12 seconds. Kitty Hawk, Jr., was again second, Baby Reliance III third, Scat fourth, and Whiz, Jr., failed to finish.

Baby Reliance III is somewhat changed from her last year's form. She is built up higher and has pontoons along her side. Her power is a 250 H. P., 6-cylinder Pierce-Budd motor, and her length is 26 feet.

The next class to be called was for 20-footers, and like the morning race again there were two starters—Baby Reliance II replacing Peter V, which was still on the ways, and Kitty Hawk, Jr. Baby II., a new hull of the same design as the older one of the same name with a few minor changes, which made her a much better appearing craft, at least, started off with a rush and finished with the same rush, covering the 10 miles in 13.18, the fastest time of the day, so far, which figured out 45.1 miles per hour. Evidently her design is no poorer than it was a year ago, nor has the 180 H. P. Sterling motor lost any of its vim or reliability. Kitty Hawk, Jr., came along 1 minute twenty seconds late at a 41 mile rate.

The next race for 26-footers and under brought together the winners of the two previous races—Hazel II and Baby II. Baby II came out on top with a speed of 44.8 and Hazel II a close second. Following these came Kitty Hawk, Jr., and Scat. Kitty Hawk, Jr., was the only starter at 4:30 in the last race for the smaller boats and she, consequently, had everything her own way.

Then came the grand finale, the Perry Centennial Free-for-all with $1,500 for first place, $800 for second and $500 for third. Interest ran fever high—Kitty Hawk V, never yet given an official tryout, had been made fast in front of the judge's stand all day, her crew just longing for the time for this race to come. For hours before at frequent intervals they would adjust some part of the mammoth engine's anatomy. This boat is Hacker's latest creation—a twenty-foot single step hydroplane with a 12-cylinder, 300 H. P. Van Blerck motor. Like her smaller sister she uses a Harthorn propeller.

Another newcomer appeared for this race also—Thelma, owned by the Thelma Motor Works and powered with a motor of the same name.

Peter Pan V was also back in shape, but Baby Reliance III was not there due to burning out her clutch and gear in an earlier race. Otherwise, all the celebrities were there, seven in all and the start was a grand one. Peter Pan V had the honor of leading the fleet over the line but there was no open water between the first and fifth boats. Kitty V jumped to the front at once, closely pressed by Hazel II and Baby Reliance II. But luck was against these two boats, for Hazel went aground at the first turn and Baby II broke a jack shaft before the first turn was reached. Kitty Hawk, Jr., therefore went into second place, Peter Pan V to third, Thelma to fourth and Scat to fifth, in which order they finished. Kitty Hawk V made a record on her first of the three ten mile laps, doing it at the rate of 47.25 miles per hour, but not being pushed she eased up, finishing the race with a speed of 43.6 miles per hour.

To Kitty Hawk V goes the credit of the fastest ten miles, but to Baby Reliance II goes the best speed for an entire race—45.1 miles per hour. (Full detail summary given on page 36.)

(*Continued on page 62*)

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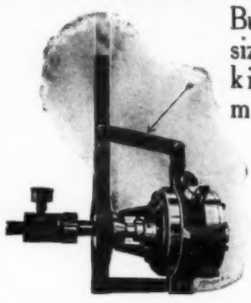

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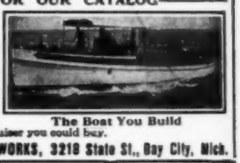

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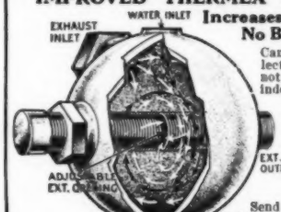

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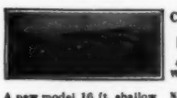

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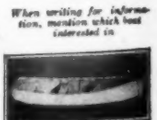

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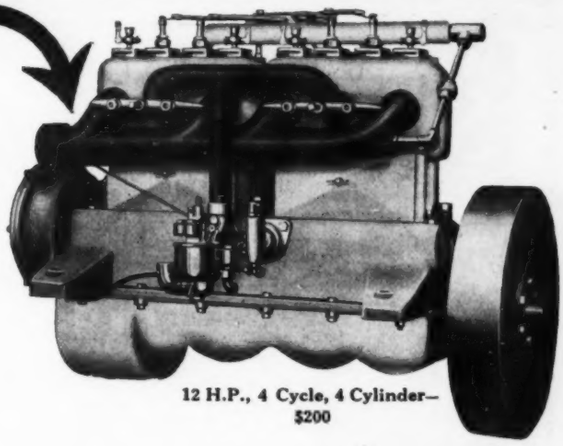

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The Perry Centennial Races.

(Continued from page 60)

The scene of the Regatta now shifted from Toledo to Put-in-Bay, and, oh, such a place! What would Easterners think of a series of races staged from Steeplechase Pier at Coney Island? Almost similar were the conditions at Put-in-Bay—the Coney Island of Lake Erie. Not the sign of a yacht club for headquarters and a course laid out where no one could see a sign of a racing boat except if he was fortunate to get aboard some friend's boat. As soon as the yachtsmen reached shore they were immediately lost among the thousands of hawkers and others that prey upon the visitors. And then the course—the Committee said it was nine statute miles once around, then they changed their minds and said it was ten nautical miles, and then when the contestants showed a speed of six miles an hour, which should normally be eight or ten—well, then there was trouble all around.

Good work was done by the judges, Messrs. Bishop, King, Hand, Lawley, Hughey, Still and Smith, each a Commodore or an authority on racing subjects, and as fast as the regatta committee would strike some problem which they did not care to pass upon they would turn it over to the judges who would convene in secret session and soon hand down a decision.

However, after every one had taken in the main attraction, thoughts began to again turn to racing and the Bang and Go Back races for cruisers on Wednesday afternoon brought out nineteen starters which were divided into three classes.

There were some close finishes as the summary will show.

Cincinnatus won in her class by only two seconds and Alice won the small class by ten seconds.

Twenty-three boats started in the Bang-Go Back race for open boats. Fritzie won in the class under 20 feet; Twilldo, in the 20 foot-26 foot class; Nanky-poo, in the 26 foot-32 foot class; and Craftsman in the large boat class.

On Friday came the race in which only two boats started, yet attracted more interest than any other race at Put-in-Bay. This was the cruiser race between Speejacks, owned by A. Y. Gowan, and Shadow, owned by Carl Fisher. The stake—the loser to pay the winner's expenses for his trip to Florida this winter—was in itself enough to warrant the most thorough preparations for the race, and the preparations were surely not neglected. Everything not actually needed for the propulsion of the ship was removed—plumbing, cooking appliances, awnings, bedding, etc., in fact, everything. The varnish work even showed traces of being scraped down to remove weight and the bottom was as smooth as the smoothest glass. The highest grade of gasolene was brought especially for the race, and Speejacks was equipped with two new 8-cylinder Speedway motors to do the trick. Shadow only had two 6-cylinder motors of similar make to give her a chance for the money.

The start was of the horse race fashion and it took three trials before they could be brought to the line together. At the crack of the gun both boats opened up and it was a fine sight, but the greater power of Speejacks at once gave her the advantage and she slowly but surely forged to the front. The course 33 statute miles in length from the Committee Boat, Tourist, anchored off Gibralter to and around West Sister Island and return was made in 1 hour 7 minutes 31 seconds by Speejacks, and Shadow took 1 hour 12 minutes 5 seconds. The speed of the winner was 29.4 miles per hour, without question a world's record for a cruiser race.

Barbara II, powered with a 50 H.P. Ralaco motor, won the three heats in the Motor Launch Championship for Cruisers between 40 and 60 feet in length.

The race for the cruisers over 60 feet was postponed, owing to the fact that the course was laid out the wrong side of a government buoy at one turn and the first two boats to turn grounded.

Buffalo's Big Regatta.

That the annual motor regatta which will be held on the Niagara river from Motor Island during the last three days of the first week of September, in connection with the Perry Centennial commemoration, will be the best motor boat event held this year, is assured. Nothing will be left undone by the committee of which Past Commodore William J. Gunnell of the Motor Boat Club of Buffalo is general chairman. The program for the event has been prepared and already entries have been received from the owners of some of the fastest motor boats in the country.

Chairman Gunnell, who is being ably assisted by Vice-Commodore Harold Kelley, Fleet Captain James A. Johnson and the chairmen of the various committees appointed recently, is working hard to perfect every detail and to make the races this year far superior to those held on the Niagara river a year ago. This program will be a part of the Perry Centennial program and will be one of the most interesting features of the week's schedule. While the celebration opens on September 2, the motor boat regatta at Motor Island will not start until September 4. Besides the E. R. Thomas trophy, the Buffalo Chamber of Commerce trophy and the Thomas Moffat cup, the club has been donated a most beautiful and costly trophy by Commodore J. Stuart Blackton, of the Atlantic Yacht Club of New York City. This trophy is of solid silver. It is a large buffalo mounted on what is to represent Motor Island.

The program for the races at Motor Island has been arranged as follows:

Thursday, September 4, 11 a. m.—Five-mile cabin cruiser race. First prize, silver trophy and $200; second prize, $200; third price, $100.

4 p. m.—Buffalo Chamber of Commerce race, distance twenty-five miles. First prize, Chamber of Commerce trophy and $600; second prize, $300; third prize, $150.

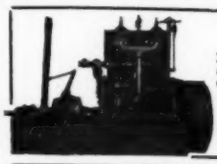
Friday, September 5, 10 a. m.—Speed trials.

11 a. m.—Ten mile club race 400" class displacement boats. Open to members of Motor Boat Club only. First prize, Moffat trophy and $300; second prize, $200; third prize, $100.

4 p. m.—The E. R. Thomas $2,500 trophy race, distance thirty miles. First prize, silver trophy and $600; second, $300; third, $150.

Saturday, September 6, 11 a. m.—Small hydroplane class, distance twenty miles. First prize, silver trophy and $300; second, $200; third, $100.

4 p. m.—The Blackton trophy race. First prize, silver trophy and $850; second, $450; third, $200.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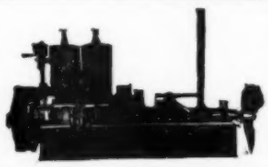
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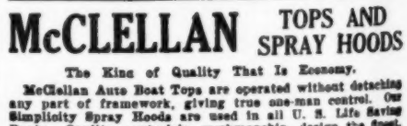

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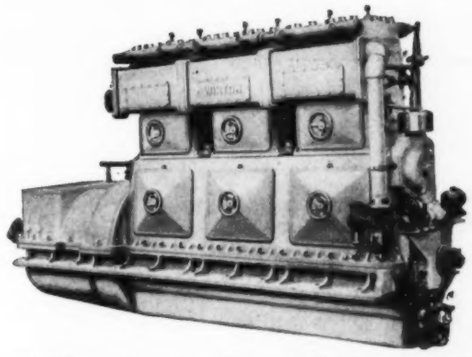

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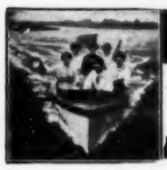

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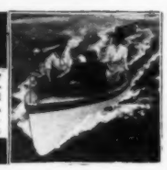

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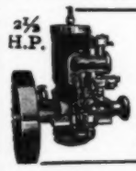

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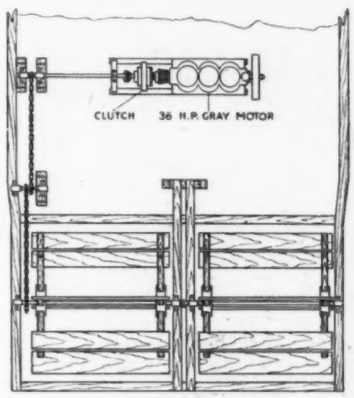

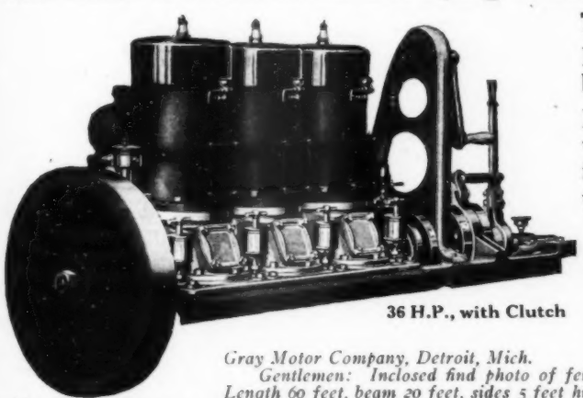

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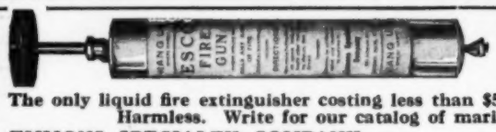

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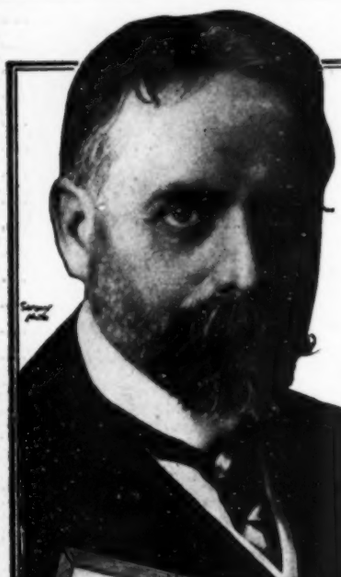

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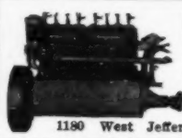

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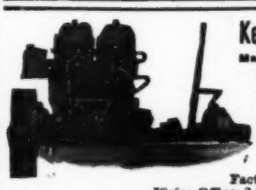

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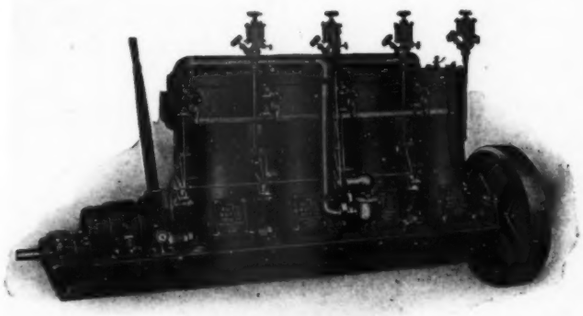

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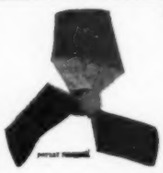

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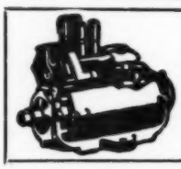

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A 40 H. P. Model 13 Loew Victor in a nine-year-old antiquated Florida Skate Model—the "Red Devil"—won the National Association Interstate Cup at Toledo, July 28th, 1913, beating a number of higher powered displacement boats and hydroplanes. The "Red Devil" won because her engine never stopped for an instant, although she had been driven from Cleveland to Toledo on the previous day.

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"Twill-Do"—a 24 ft. x 5 ft. 6 in. Hand V-Bottom Runabout, with a Loew Victor Engine—won the 26 ft. Open Boat race at Put-in-Bay.

Loew Victor Motors are not special built racing machines. Every Loew Victor is a stock outfit and will always run smoothly and quietly at maximum speed and develop more power for piston displacement than any other motor on the market. We guarantee their horse-power on any set of accurate test blocks.

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I get better control with a Planhard, and use practically one gallon of gasoline less per hour than when I used one of the most popular carburetors in use to-day.

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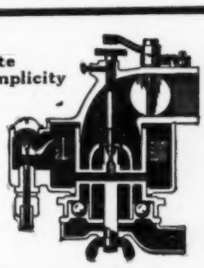
Note Simplicity



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made a mile in 1 minute 8 seconds over the Washington Government course with Planhards.

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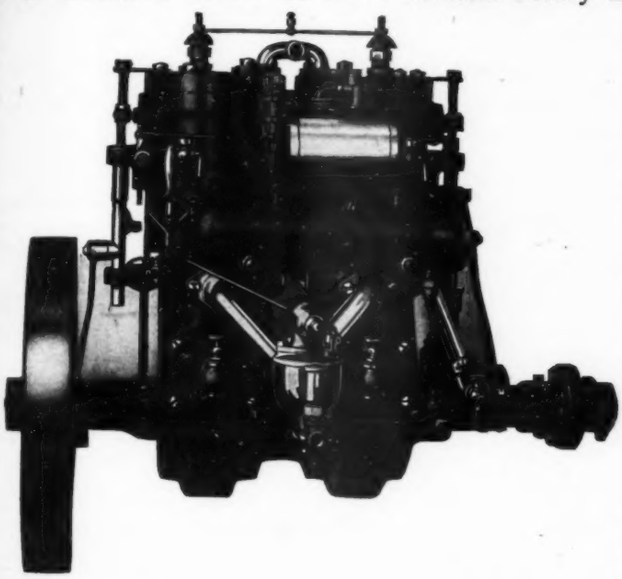

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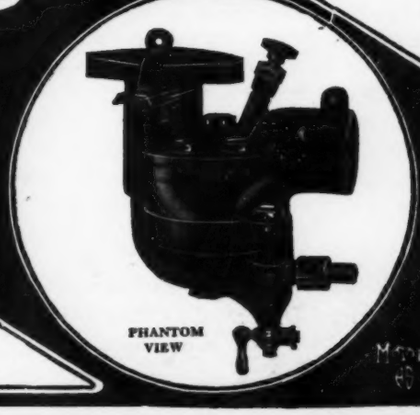

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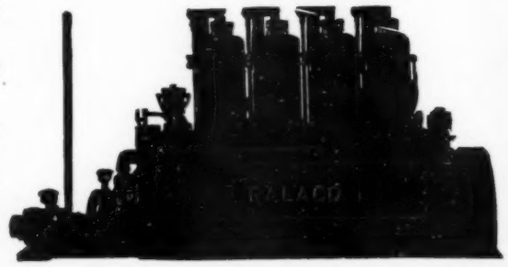

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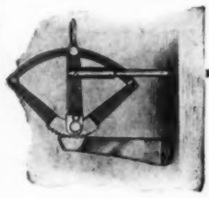

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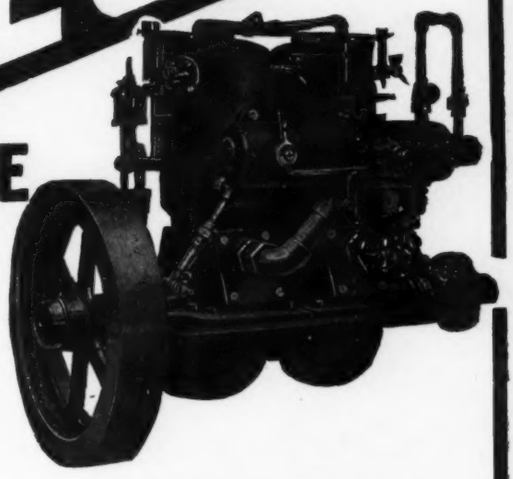

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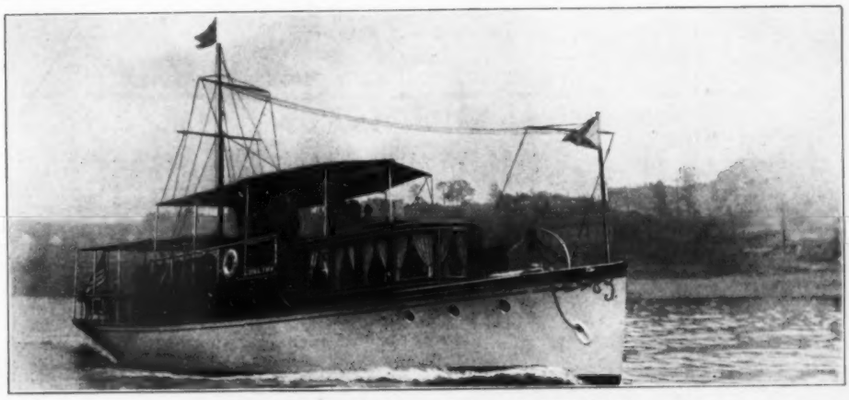

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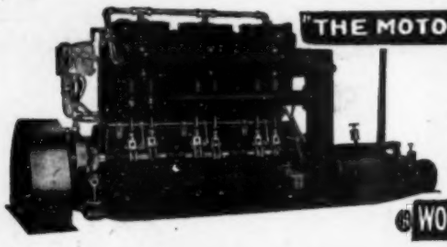

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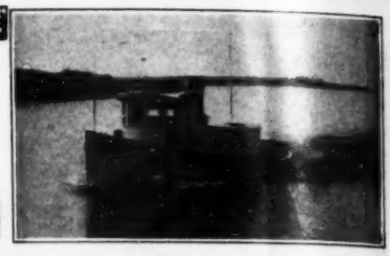

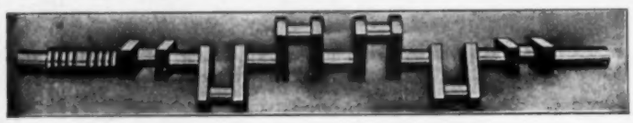

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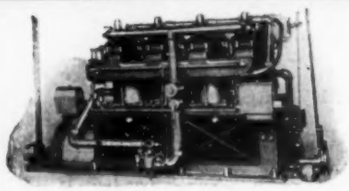

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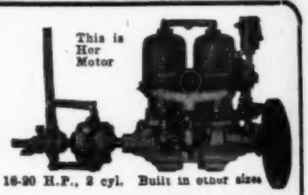

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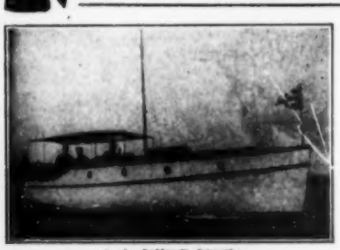

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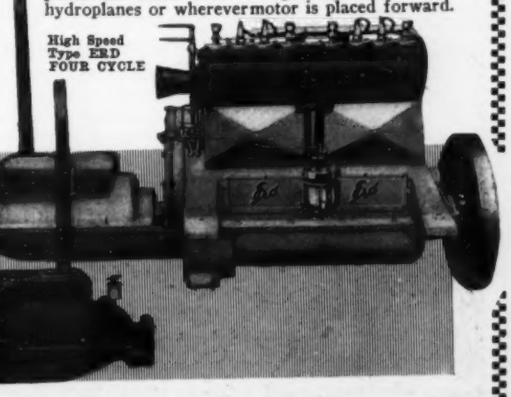

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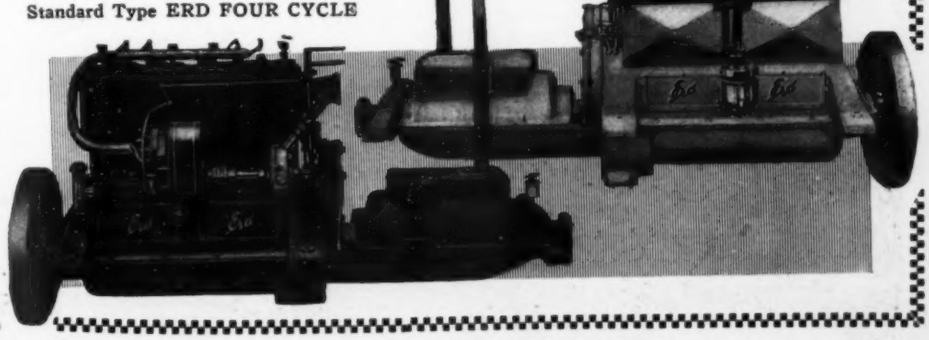

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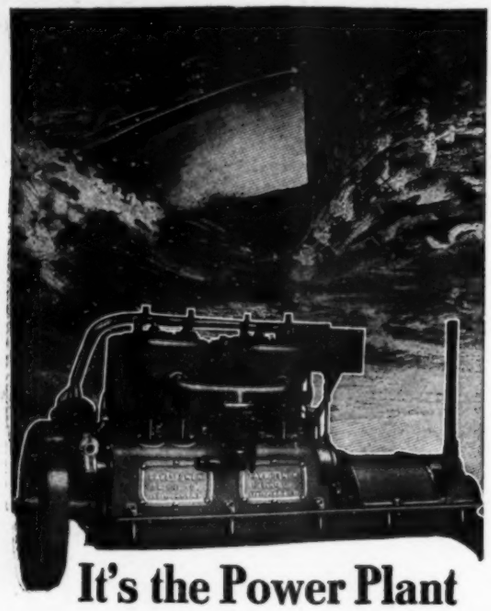

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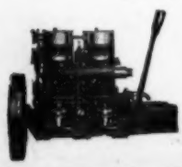

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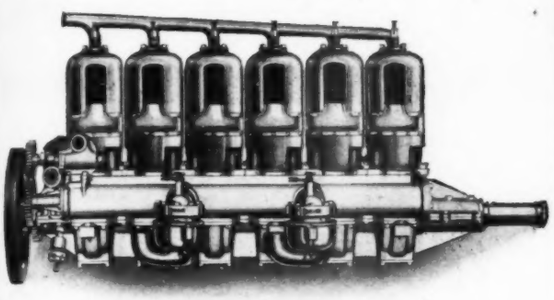

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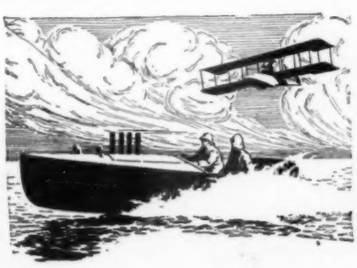

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IN A NEW TYPE FOR 1913, FROM 1 TO 40 H. P.

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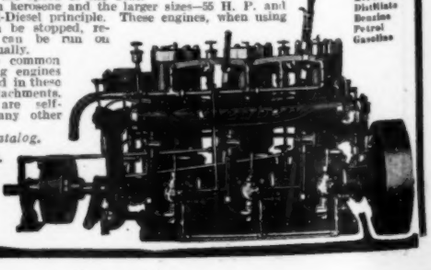

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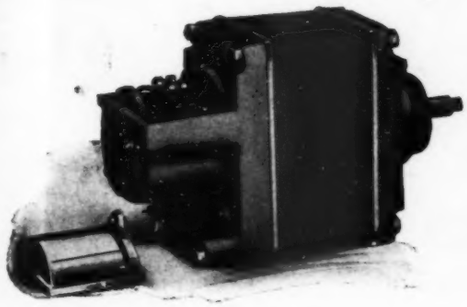

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Starting and Lighting System

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The Leece-Neville is a 24-volt system powerful enough to turn over large marine engines and furnish lots of power to light your boat.

Requires little attention, and never fails to work under all weather conditions.

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Marine handbook sent free to all who write.

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It Always Starts—Always Runs

"I have been using one of your Eleven Horsepower Motors in my launch since April, 1912, and have never had any trouble or spent a dollar for repairs. I have used it with your high tension magneto installed at the factory, and have never used a battery or had the engine fail to start. I consider it the most desirable motor on the market for pleasure boats.

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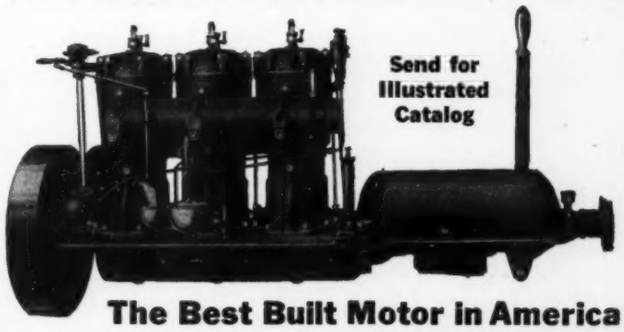

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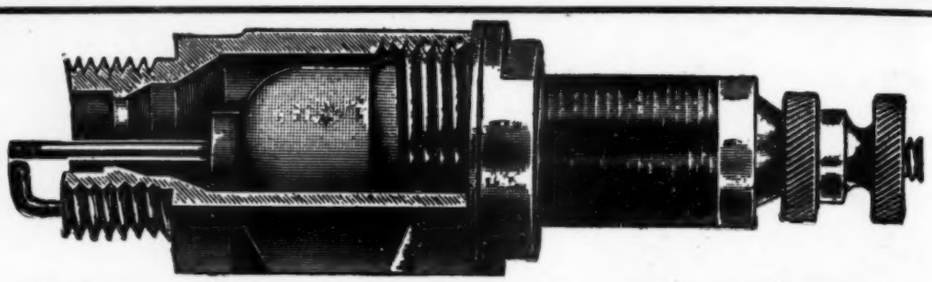

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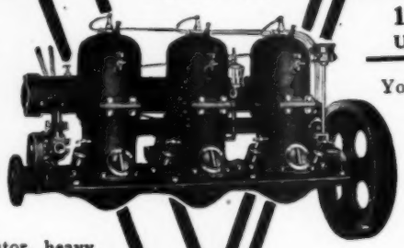

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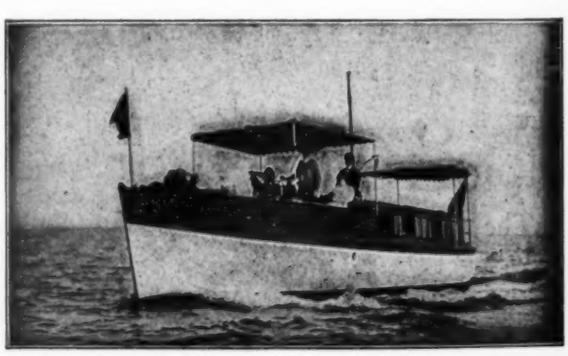

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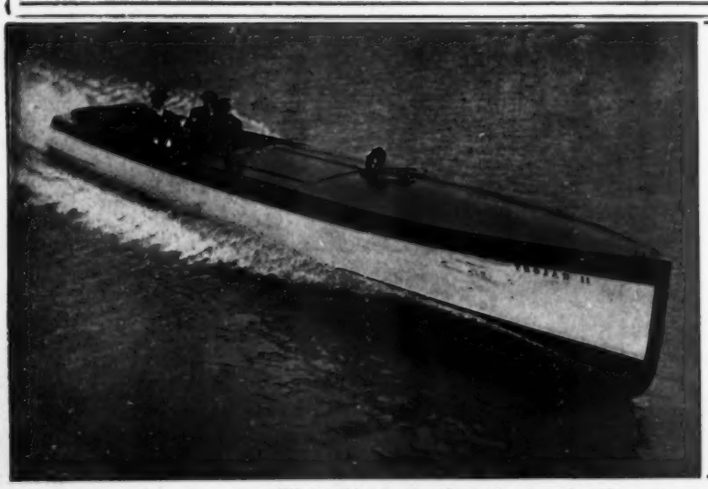

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DEMOCRATIC COMMITTEE

Troy, N. Y., Mar. 11, 1913

Niagara Motor Boat Co., North Tonawanda, N. Y.

Dear Sirs:—I am in receipt of yours of the 1st inst., and in reply beg to say that it will be a pleasure for me to recommend your boats, should any customers seek information from me.

My boat has been a wonderful success, in fact it has given me greater satisfaction than I anticipated at the time of purchase. Do not hesitate to refer to me at any time.

With kind personal regards, believe me, Very truly yours,
Dict. J. J. M. Signed. JOSEPH J. MURPHY.

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At Toledo made a clean sweep by using a

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Kitty Hawk, Jr. took second in free-for-all

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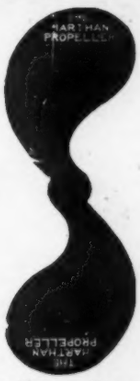

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YOU SAVE THE DEALER'S PROFIT ON LA MOTORS

It won't cost you as much as you thought to enjoy the pleasure of motor boating this summer. The old, reliable, "keep-going" Lockwood-Ash motors are sold direct from factory to you at a big saving.

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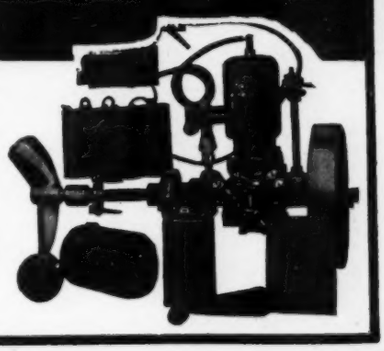
Immediate Delivery Six models, all guaranteed for one year, and sold on 30 days' trial. No strings to this offer, no freight to pay. Just send for any of our complete outfits, and if it doesn't delight you send it back at our expense.

The 1 1-2 H. P. Motor and Outfit Complete shown in illustration. **Freight Paid,** only **$36.25** —a clear saving of at least $13.75. Post yourself on motor boating and the safest, cheapest way to buy by writing today for our 1913 catalog. It's soon time to start—**Get Busy.**



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DON'T BUY until you read our booklet, "PROPELLERS IN A NUTSHELL"

it also tells you about COLUMBIAN RUDDERS, Outboard Rudders, Speed Boat Rudders, Hydroplane Rudders, Launch Rudders, Universal Struts, Universal Stern Struts, Combination Outboard Rudders and Universal Stern Struts. *Write*

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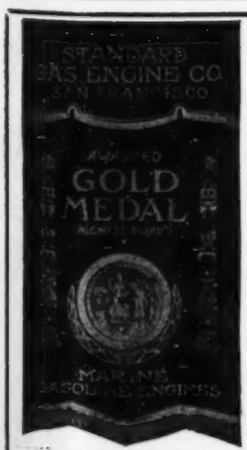

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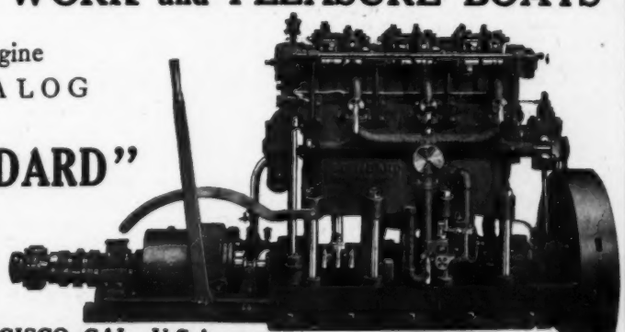

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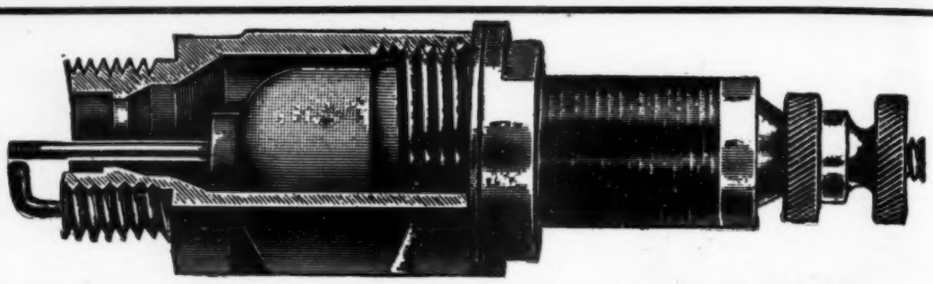

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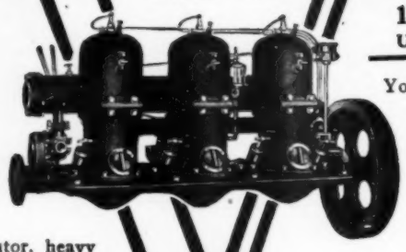

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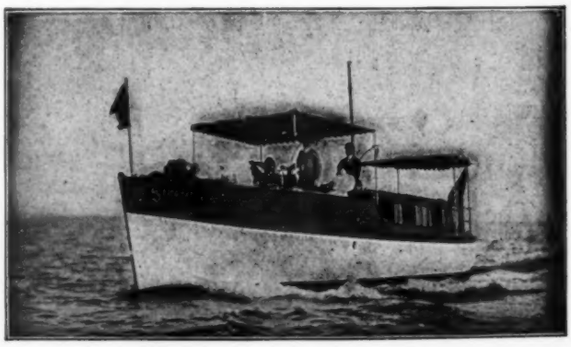

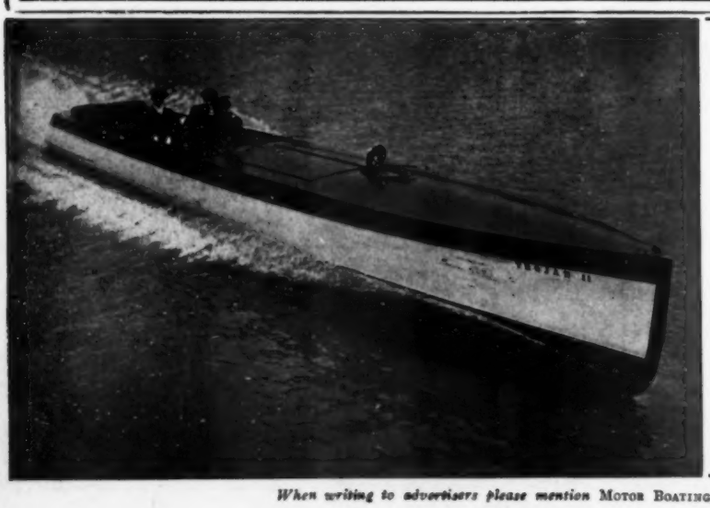

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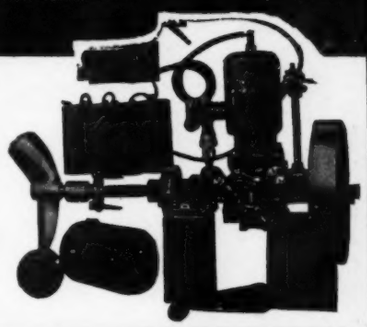

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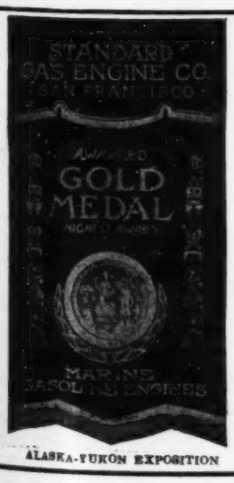

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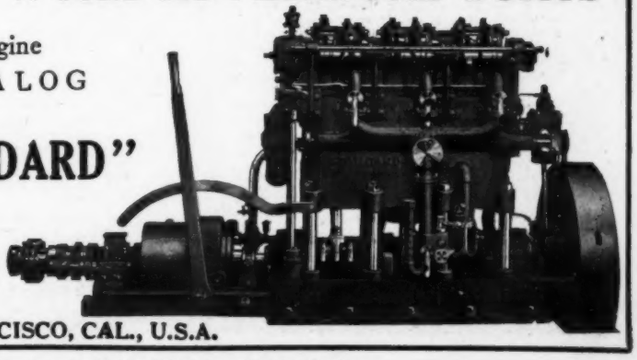

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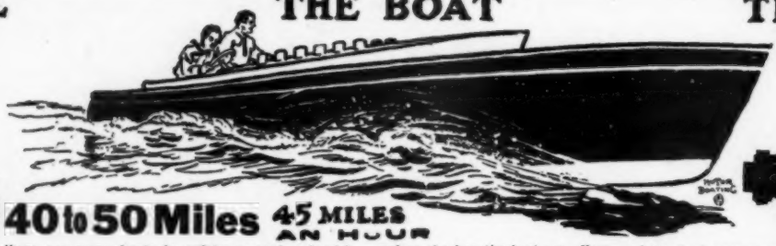
THE WHEEL

THE BOAT



THE GEAR

40 to 50 Miles 45 MILES AN HOUR

That is pretty high speed, but there are many boats in existence equipped with Michigan appliances that have attained it. Of course, more or less of the credit for attaining such high speed is due to the design, form and construction of the boat. BUT—

A very considerable portion of the credit is due to the fact that the engines turn Michigan speed Propellers, and that the power is transmitted through Michigan Multiple Disk Reverse Gears.

The best boat in the world with the best motor cannot make her best speed, unless she has the best propellers, and the best reverse gear, and that means Michigan, first, last and always.

As the ancient Romans said, "Festina Lente" (that is, in preparation, not in execution). Therefore, think it over before you commit yourself to anything else.

Likewise as the same old-time wise ones said, "Verb. Sap." ("A word to the wise is sufficient.")

Wheels and Gears are not the only things we make. Before fitting out, you had best get our catalog, for you will learn from it that we make every conceivable thing in the way of boat fittings and equipment, and all of the best.

MICHIGAN WHEEL CO., 1115 Monroe Ave., Grand Rapids, Mich., U. S. A.

Eastern Branch, 60 Cortlandt Street, New York. Remember the Name, "Michigan"

The Details of the Milwaukee Runabout

have been worked out to a nicety that until recently was unknown in boat building. It is beautiful in appearance, comfortable and fast, and thoroughly high class in every respect. Let us submit designs before it is too late to have your new boat for this season.

MILWAUKEE YACHT & BOAT COMPANY

1375 BECHER STREET MILWAUKEE, WIS.

MATHIS-BUILT HOUSEBOATS

NOW—before you plan your stay in Florida for next winter—is the time to investigate the houseboat question. You will find Mathis-built boats

LUXURIOUS, SEAWORTHY HOMES

far different from the average cruiser (with its restrictions and inconveniences) and from the old-style houseboats (with their unwieldiness).

Get the facts, compare the figures—note how readily the Mathis Houseboat traverses inland waterways unnavigable to cruisers of equal size. Remember that Mathis-built Houseboats cost less to build and operate, yet possess every advantage of cruisers of 25 per cent. greater length.

Your Address Brings Full Particulars

MATHIS YACHT BUILDING COMPANY

Specialists in 60 to 100 ft. Houseboats and Cruisers

Cooper's Point CAMDEN, NEW JERSEY

The MIGHTY MERCURY Drove GUNFIRE Jr.

This is the Mighty Mercury 52 H.P. Special which drove the 20-ft. hydroplane Gunfire Jr., through its long list of records during 1912—one of the most successful racing seasons ever enjoyed by any boat or its owner. Ten firsts, one second, one fourth (broken propeller), and several records in hydroplane and displacement classes and free-for-all races.

The 52 H.P. Special has 5¼" bore, by 5" stroke. For power, flexibility, durability, smoothness and reliability, it is ideal for racers, cruisers and work boats.

Die cast bearings and every bearing surface is uniformly larger than the corresponding bearing of any other motor. 2⅛" valves, both inlet and exhaust. Capacious water jacket.

Reverse gear bed cast integral, with lower half of crank case. Paragon special reverse gear, with positive reverse lever lock, eliminating ringing and rattling noises.

Positive lubrication to every friction point. Becker imported Hollow steel wrist pins.

Write today for the Mercury Book.

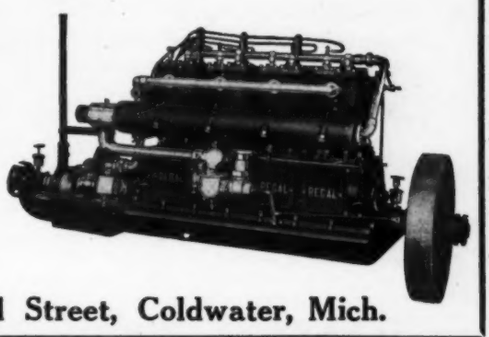
Two New Models. 6½-in. Bore x 7-in. Stroke.

4 Cylinder—125 Horsepower. 8 Cylinder—250 Horsepower.

MERCURY MOTOR CO., Produce Exchange New York

THE power plant is the most vital part of any boat. The pleasure of a cruise or the reliability of a working boat is dependent upon it. There are worthless, cheap engines whose price alone is calculated to catch the eye of a buyer or there are engines such as the

REGAL OIL ENGINES

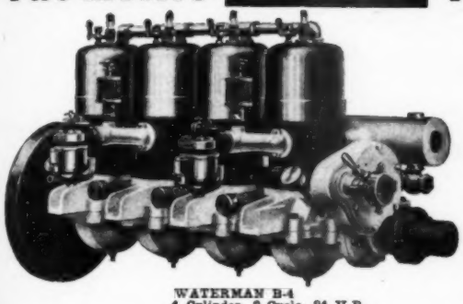


which have reputation and experience back of them and give true value for their price. It is yourself alone who must make the choice, but before you decide write for a Regal engine catalogue and find what we have to offer. It won't cost you anything but a postal card.

In the catalogue are described the Regal kerosene engines, which are universally giving such satisfaction and saving money in fuel cost for their owners.

REGAL GASOLINE ENGINE CO., 74 West Pearl Street, Coldwater, Mich.

Two Motors that have made The Waterman Reputation World-Famous



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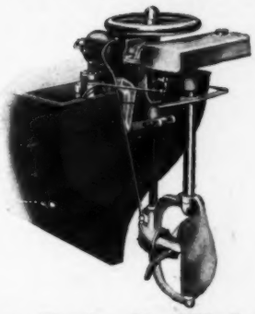
4 Cylinder, 2 Cycle, 24 H.P.

Sturdy, dependable, powerful—Waterman Motors meet the severest tests whether of rough open sea or extended speed contest. For pleasure boats, rowboats, hydroplanes, work boats—there's a Waterman for every purpose. Every one is guaranteed for life—every one is light, robust, smooth-running.

The Porto Makes the Rowboat a Pleasure Boat in 3 Minutes

This famous midget gives TWO FULL H. P.—weighs but 56 lbs. complete, propeller, rudder and all. Bore, 2¾ ins.; stroke, 3 ins. Copper-jacketed; under-water exhaust; steers with tiller ropes. Drives an 18-ft. rowboat 7 miles per hour. 4 hours on a gallon of gasoline. Eighth year of success—it's the original.



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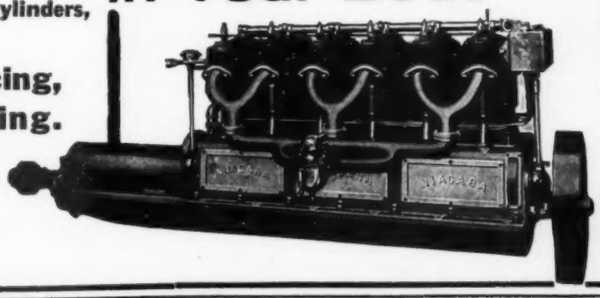
In Your Boat

Four Cycle, in 2, 4 and 6 Cylinders, 5 to 100 H. P.

For Cruising, Racing, Fishing, Freighting.

75% of Niagara Sales due to Satisfactory Service.

Niagara Motors will Operate on Kerosene or Gasoline.



Highest Quality at Moderate Price.

In Service Nearly Ten Years and Not a Dissatisfied Customer.

We can save you money and much annoyance. Get Catalog.

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HYDE TURBINE TYPE PROPELLERS

Are the Most Efficient For Speed, Pleasure and Commercial Boats

Unexcelled in design, material and workmanship.
Made in diameters and pitches to suit all conditions.

All Genuine Hyde Propellers have the name stamped on the hub.

The Irish Pneumatic Clutch Control

The latest and best method of controlling the engine from the steering stand or station, using air from the whistle tank.

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READ THIS!

In the Bermuda Race at least one boat was incapacitated by a riveted gasoline tank.

This boat was the "Tec." In spite of advice to install "Jasco Tanks" she was sent to sea with her gasoline stored in the ordinary riveted tanks, which burst, disqualifying her from the race at the very start. This was doubly unfortunate as, being a speedy boat, she had a big chance of winning. Neglect in providing a safe receptacle for gasoline compelled her to give up without even an effort. It is also understood that the "Dream" had trouble with her riveted tanks in the same race.

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prevent such annoying and dangerous accidents

Being made seamless and leakless, of drawn steel, they provide what is practically a trouble and calamity proof gasoline storage for both motor boats and automobiles.

Every good sportsman is interested in the craft or car he drives, as well as in the welfare of its occupants. You can provide no better nor surer insurance for both than a "Jasco Tank."

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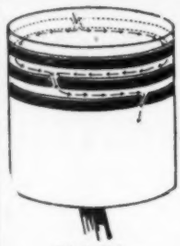

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The Old Way and The Right Way=

Follow the line of arrows—this represents the course of the escaping gas. This means imperfect compression and lost power. You can't prevent this with the old-style, one-piece piston rings. Use

TRADE-MARK-REGISTERED

Right Way

Piston Rings

(PATENTED)

Follow the line of arrows here—this represents the course of the gas seeking outlet—but it can't get through solid metal. Leak-Proof Piston Rings make leakage of gas between piston head and cylinder impossible. They give maximum power and minimum carbonization. Gas can't escape down—oil can't go up.

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Insure perfect compression.

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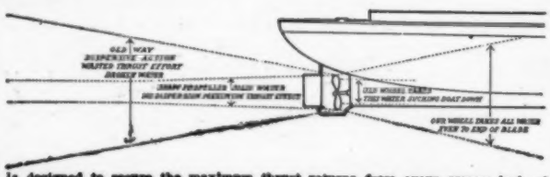
GUARANTEES Greater Efficiency and Gives More Speed Than Any Other Make.



Is designed to secure the maximum thrust returns from every square inch of its surface—AND DOES SO.
Eliminates objectionable over-squatting of the boat's stern, and minimizes vibration.

MADE OF THE FINEST MANGANESE BRONZE PROCURABLE.

Prices and further particulars

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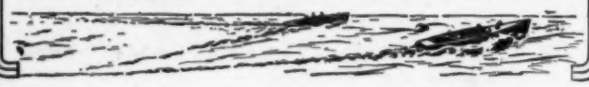

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The best varnish made for interior marine work, cabins, woodwork, floors, etc. Furnished in colors and clear.

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Economizes Fuel
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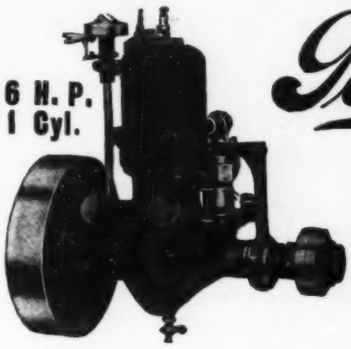

6 H. P.
1 Cyl.

Toledo

MARINE MOTOR

$74.85

This price, $74.85, includes motor complete, with Schebler carburetor and Connecticut Ignition outfit. Single cylinder, 6 H. P., 2 cycle, 2 port, 4½ inches x 4½ inches, heavy drop forged crankshafts and connecting rods, all bearings of nickel babbitt and adjustable, die cast interchangeable connecting rod bearing, piston pin bronze plunger pump. All motors reversible while running. Elevated timer driven by bronze gears which are completely encased, long water jackets designed so that water circulation and cooling is perfect. Simple and positive oiling system. Note the prices.

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OUR LATEST FACTORY CLEAN UP

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Regular Price $350

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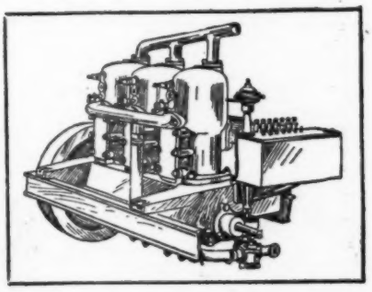

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No stern wheel. No tunnel stern. No screw propellers. No shaft under water. No strut. No non-lubricated outboard bearing. No projecting rudder. No rudder-stock, brackets, quadrant, tiller rope or pulleys. No torque.

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The fastest hull for low and moderate powers yet devised. Built under the supervision of the designers. We are sending these boats to all parts of the world.

Write for free Viper treatise and illustrated description of surface propeller boats.

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25 Miles Per Hour Guaranteed

20-ft. 4 Passenger 30 H. P. Motor

Beautifully Finished in Mahogany

The Eldredge-Whitaker Hydroplane presents the best ideas in up-to-date motor boat and hydroplane construction. Fast, comfortable, dry, seaworthy, easily controlled—it is equally valuable as a racer or speed boat, a family runabout or a yacht tender.

Last season one run of 56 miles was completed in 1 hr. and 50 min.—an **average** of better than 30 miles per hour. During the season it encountered all sorts of seas and proved itself capable and safe under every condition. After a year of success this model has been perfected to be better than ever for 1913.

Priced 40% lower than a single boat would cost from the same plans. 30 H. P. Featherweight Erd Motor and all equipment ready to drive. Also sold **Knocked Down** crated for foreign or domestic shipment.

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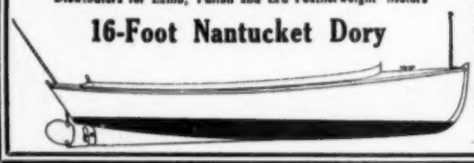
Distributors for Lamb, Fulton and Erd Featherweight Motors

16-Foot Nantucket Dory



The most seaworthy and most substantially built boat of its size in the world. The most Real Boat ever offered at the price. 3½ ft. wide. **Fulton Motor $250** Also sold Knocked Down

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Simplicity, Efficiency and Reliability

are some of the superior qualities of AMERICAN MOTORS, and are of **vital importance** to YOU. The AMERICAN is absolutely **right** in design and principle of operation, and must run **continuously** from the time you start it until you throw off the switch—it can't do anything else. YOU should own an AMERICAN and enjoy the **full** pleasure of motor boating or get **constant** service with your work or fishing boat.

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Starts without cranking, is reversible and runs on gasoline, **kerosene** or other fuel—very economical and is the one favorite with boatmen everywhere. Thousands in use and all giving perfect satisfaction and efficient service in every kind of boat.

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All sizes, 2 to 30 h. p. Lowest possible prices. Let us tell you all about the AMERICAN. Write for new Free Catalog giving full information and prices.

Good demonstrator Agents and Boat Builders, write for special terms and sales plan. Some valuable territory still open. **Get in on this now.**

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Hopkins Electric Tachometers

Model M—400—VIII

For

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Know That Your Engines Are Running At The Same Speed

An assistance in navigation and a check on the performance of your engine and the speed of your boat.

No Flexible Shaft

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A partition divides the tank into two compartments—one for gas engine oil and one for a heavier, cheaper oil for the bearings, gears, etc.

Detroit Oilers are made for **every** kind of engine—marine, stationary, automobile, truck and gas tractor—with pulley rachet, gear or sprocket, drive for **easy** installation on any outfit.

Detroit Oilers are **insurance** against lubrication troubles.

Specify a Detroit Oiler on your next engine, or put one on your present outfit.

Write today for catalog No. 64 and full information, stating in what kind of engine you are interested.

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DETROIT, U. S. A.

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"I Ran My DOMAN Four Years Without 1c for Repairs"

is the substance of a letter from H. E. Mulick, Peoria, Ill. Pretty good evidence, don't you think, that the Doman is **built** right? And, after all, that's what counts in engine service—the **building.** No matter how good the materials used, if the design and the workmanship—the building—isn't right, the engine won't amount to much.

That Doman motors are built right is evidenced by the long and satisfactory service they give. Absolute dependability is built into every inch of a Doman. Why a Doman? —Ask an owner! Read the "Doman Owner's Book" and learn what the world's greatest authorities on motor boat power think of the Doman. A copy is yours, free, for the asking.

Motor Shown Below

is the Doman 4 cylinder, 20 H. P., medium duty motor. Cylinders are 5 inch bore, 6 inch stroke. Designed for all medium duty and particularly for cruising boats up to 40 feet. Other Domans range from 2 cylinder, 6 H. P., to 6 cylinder, 60 H. P. Write for Catalog.

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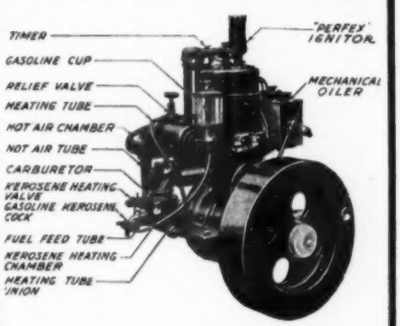

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Jos. Morris & Sons, of Trinity, Nfd., write us May 14th, 1913, in part as follows:

> It may interest you to know that we are running two of your engines, one 7½ H. P. and the other 5½ H. P., and find that they run better on kerosene than gasoline. For a comparison of the amount of fuel consumed, we use 10 gallons of gasoline, while we are using about 200 gallons of kerosene, the gasoline being used only for starting.
>
> Very truly yours,
> (Signed) JOSEPH MORRIS & SONS.

We make these motors in six sizes from 3 to 40 H. P., one, two, three and four cylinder, two and four cycle.

Camden Anchor-Rockland Machine Company
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with a modern, progressive supply house, centrally located, doing business with a big, clean stock in an up-to-date plant.

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Better Lubrication

It makes no difference what motor you have, it will last longer, consume less fuel, give you less trouble and cost less for repairs if you lubricate it throughout with

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"MAKE MOTORS MAKE GOOD"

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Lubroleine Oils are made in five grades for different types of engines and running conditions. Lubroleine Greases afford true Lubroleine quality in lubricants for compression cups, reverse gears, etc.

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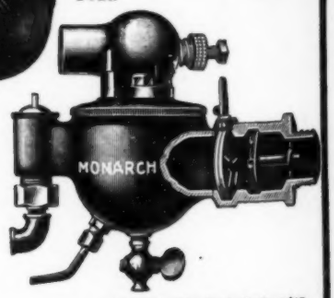

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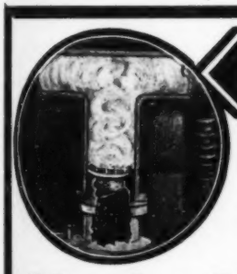

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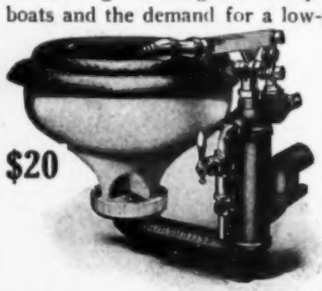

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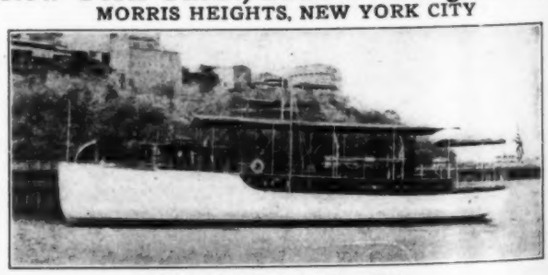

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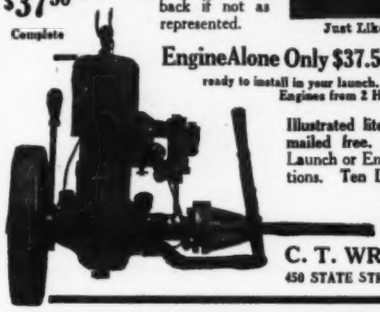

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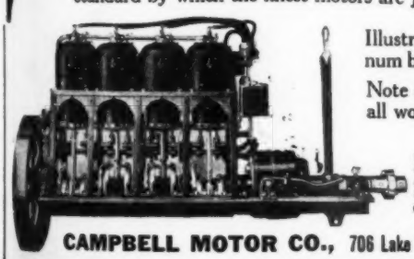

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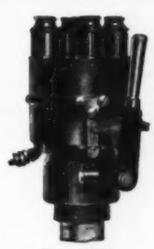

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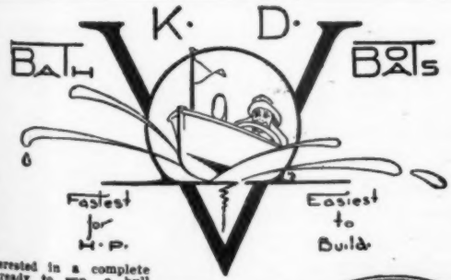

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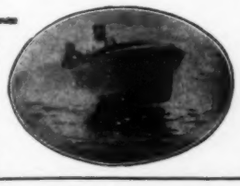

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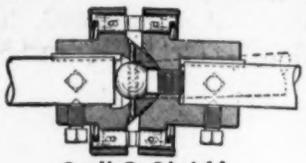

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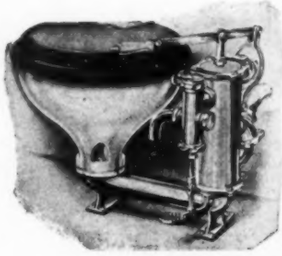

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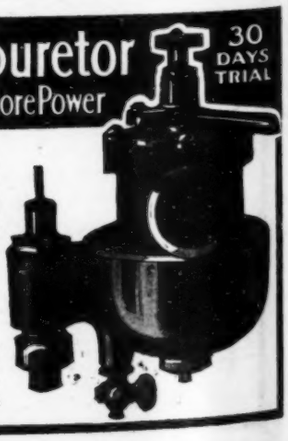

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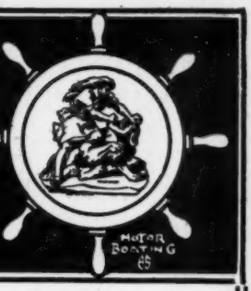

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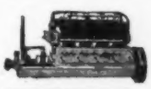

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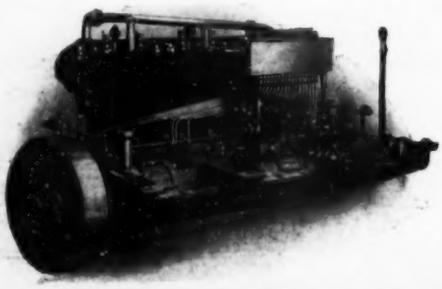
No "Buffalo" ever stopped in a seaway.

You can forget you are dependent upon a "Buffalo" engine for power just as you forget you are dependent upon the sun for light—same steady service.

That is why owners all over the world are taking less reliable engines out of their boats and putting in "Buffalos"——

DIE FLEDERMAUS III
of Owensboro, Ky., is powered with a 40 H. P. "Buffalo Auto Marine.

"Buffalo" Marine Engines



TWENTY SIZES

"Buffalo" engines are built in 20 sizes—3 to 150 H.P.—Slow Speed, Medium Speed and High Speed, suitable for work boats, speed boats, launches and cruisers. They are all of the four-stroke-cycle type.

GASOLENE OR KEROSENE

Except in the High Speed models and a few of the smaller sizes, "Buffalo" engines can be operated on Kerosene as well as on Gasolene.

MODERN EQUIPMENT

Of course "Buffalo" engines have all the modern features which can be applied with good results to their particular sizes—double ignition, self starters, return feed lubrication, water-jacketed manifolds, Delco distributor system—but get the "Buffalo Book," it tells the whole story.

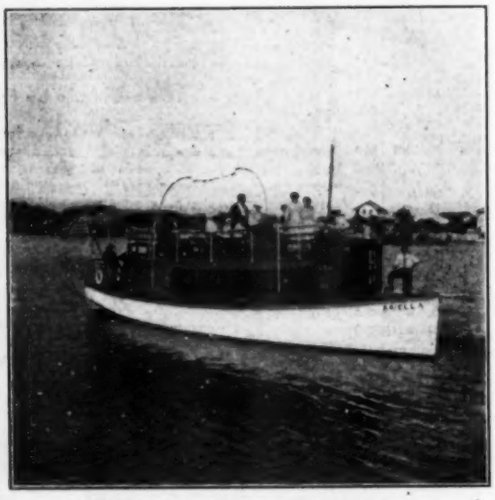
Don't forget to send for the "Buffalo Book" today. It comes for the asking.

Buffalo Gasolene Motor Co.

1274-1286 Niagara Street Buffalo, N. Y.

18,000 Miles with a Lamb Engine

Lamb Engine owners get perfect service—the kind of service every owner wants to get from his engine. No matter when or where, how far or how short notice, every Lamb Engine is ready to start and go as far as the owner's desires carry him.



"ARIELLA," Ira C. Lambert, Owner

A Typical Record

ROCKLEDGE, FLA., April 1st, 1913.

MR. A. E. ELDREDGE,
Lamb Engine Co. of N. Y.

Dear Sir:—We left Rockledge this morning 5.35 A. M. on our way to Toms River, N. J.

The boat has finished 18,000 miles since May 30th, 1911.

Expect to be in N. Y. 15th to 20th.

Very truly yours,
IRA C. LAMBERT.

Utmost reliability is a Lamb characteristic. Quietness and smoothness of operation, power, strength, economy, durability, freedom from troubles and repairs—all these good qualities are possessed by the Lamb in the highest degree. It is a thoroughly high grade engine in every detail of design, materials, workmanship and performance. All models are of the long stroke, four cycle type.

10 Models. High Speed, Medium Duty, and Heavy Duty. Two, Three, Four and Six Cylinders. Twelve to Sixty-Seventy Horse-Power. Write for latest Catalog

Manufactured by the Lamb Engine Co., Clinton, Iowa

Lamb Engine Company of New York, Eastern and Foreign Distributors **30 Church Street : : New York City**

The ***U. S. Life Saving Service demands*** maximum efficiency from all Motors installed in their Life Boats. Without it their service to people in distress would be worthless. That's why the Government has ***Holmes Motors in over 70 Life Boats.***

The Holmes is the motor of heavy, consistent, and economical service. No complicated parts to adjust. Runs by gasoline, kerosene, distillate or producer gas, whichever normal compression fuel is most economical or convenient. For this reason, will never be out of date.

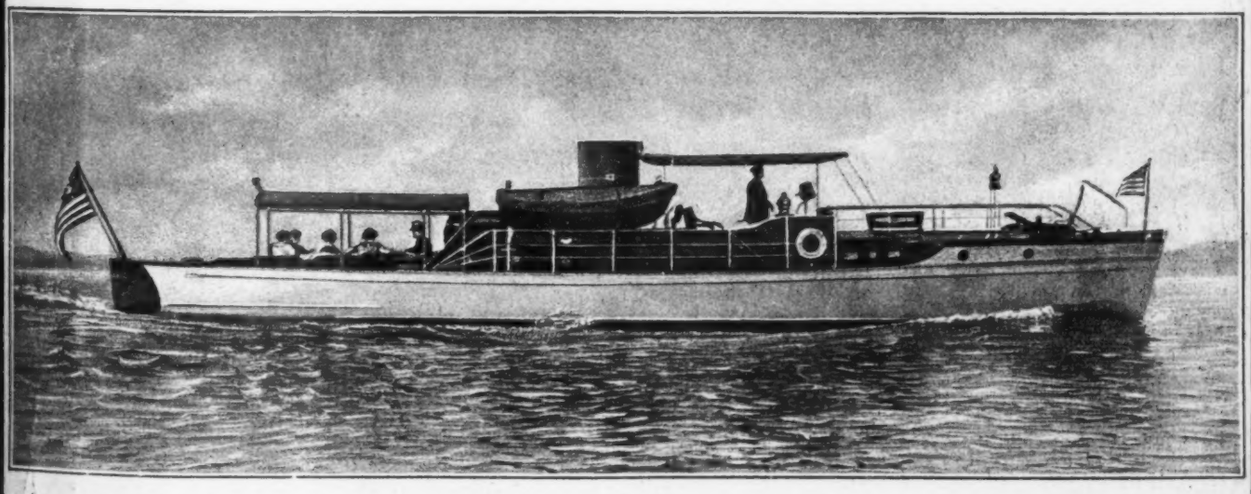
The Get-At-able Long Stroke Motor.

Send for our latest bulletins.

Holmes Motor Co.
INCORPORATED
WEST MYSTIC, CONN.

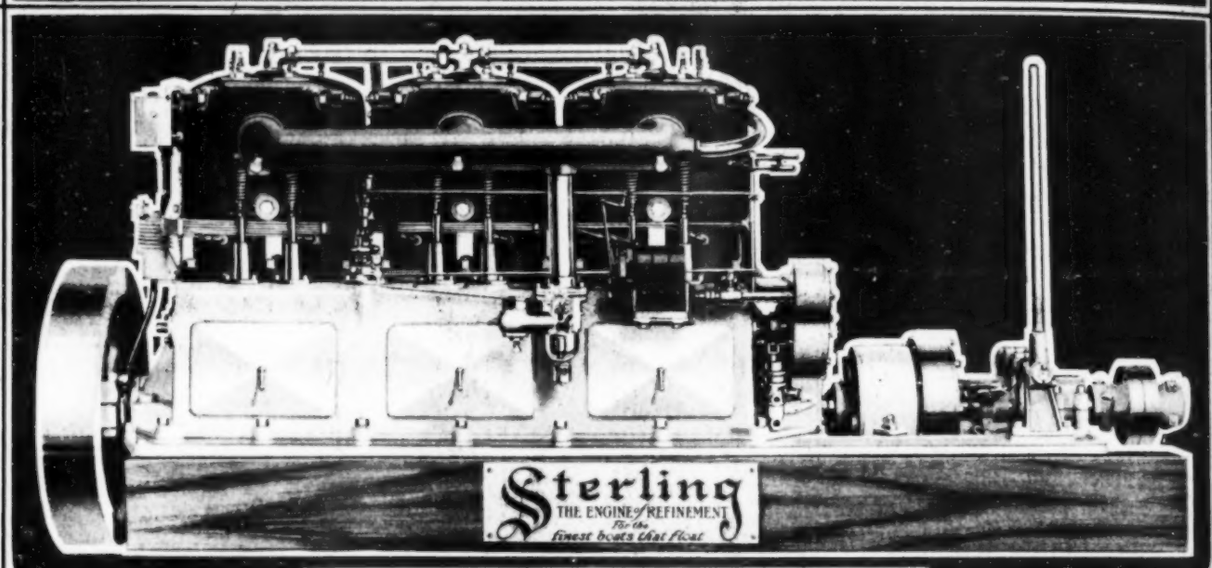
MATTHEWS CRAFT

60 x 9 ft. cruiser ELEANORE of Detroit, speed 17 miles, equipped with two STERLING 65 H. P. motors.



Scrupulous workmanship which is immediately apparent gives one a sense of security when cruising on Matthews Craft. No article built for pleasure must be better designed or constructed than a motor yacht, since there are times when your life depends upon the integrity of the builder's work. It does not pay to economize on the cost of the best construction. Be assured of having the best by purchasing a Matthews cruiser. We can make a few deliveries for Florida service.

THE MATTHEWS BOAT COMPANY, Port Clinton, Ohio



Have You a Sterling Catalog?

We want to place a copy of the handsome Sterling catalog in the hands of every motor boat or yacht owner who reads this advertisement. The Sterling engine has reached a position where it is a most important factor in the selection of every engine bought. It is a standard by which others may be judged. Before you buy any marine motor, you should know what the Sterling has to offer in the same power and specifications you are considering. For that reason you need a Sterling catalog at hand for reference purposes.

The pre-eminence of the Sterling is unquestioned. It is used in many of the finest and fastest boats in the world. It is built in so many sizes and types, adaptable for so many different purposes, that every prospective buyer should consider it carefully before he invests in anything so important as a marine engine. Perhaps the following suggestions may help you in deciding which engine you want for your purpose.

Pertinent Questions for the Engine Buyer

Do you know the difference between the various kinds of marine engines? Do you know the true economy of STERLING Engines?

Do you consider each engine on the basis of eventual value as well as present cost?

Do you know which will best fit your requirements—which can be most easily kept in perfect order—which will save repairs—which will contribute most to the value of your boat if you wish to sell it?

Have you studied the possibilities for comfort, for luxury and for continued service that can be had with a STERLING Engine?

To answer these pertinent questions we offer a 32 page booklet, profusely illustrated. It shows 36 views of different boats equipped with STERLING Engines and 16 views of the various STERLING Motors, with full descriptions and prices. This booklet will gladly be sent to you free upon your request.

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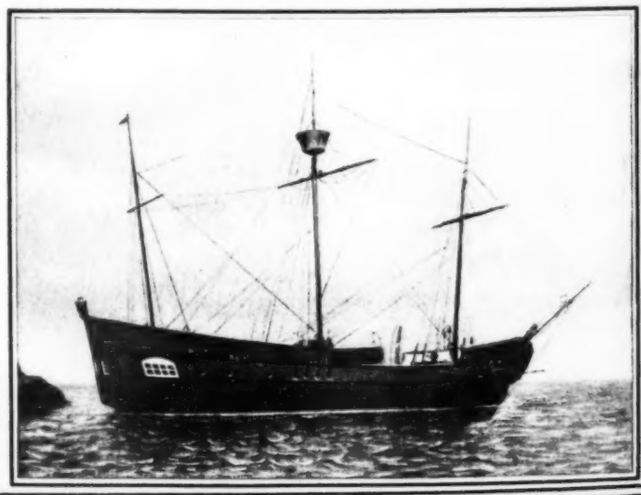
This unique boat is powered with a Heavy Duty Sterling 70 H.P. 6½ in. bore, 9 in. stroke, shown above. The boat is a replica of the caravels of four centuries ago and was built as a houseboat for Mr. Henry A. Morss, of Boston.
Designed by Swasey, Raymond & Page, Built by Stearns & McKay.



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